THE
AMERICAN
YEAR BOOK

1918

THE AMERICAN YEAR BOOK

A RECORD OF EVENTS AND PROGRESS

1918

EDITED BY

FRANCIS G. WICKWARE, B.A., B.Sc.

WITH COÖPERATION OF A SUPERVISORY BOARD
REPRESENTING NATIONAL LEARNED SOCIETIES

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PREFACE

With the publication of this volume, covering the events and progress of 1918, the American Year Book reaches its ninth issue. In the last four issues, and particularly in the last two, the scope of the Year Book as originally conceived has been profoundly altered. The influence of the Great War has assumed increased importance with each succeeding year, until in the present issue it is seen to be the dominant factor in practically every field of human endeavor. It has been necessary, therefore, to give progressively greater space to the war itself, to cover foreign affairs more thoroughly, and consequently to alter the original space allotments of many of the departments of the Year Book. Nevertheless, the organization of the work remains substantially unchanged, and its fundamental purpose remains as defined in the preface to the first issue:

"The American Year Book is intended for the needs of writers and searchers of every kind. Because of its inclusion of scientific subjects, it has been necessary to limit the political and statistical material which is the staple of many annual handbooks; the book does not aim to treat everything that could be useful, but throughout to select from the enormous mass of details those things which, in the judgment of experts in each field, are most significant, most permanent in value, most likely to answer the searchers' questions.

"The American Year Book does not aim to be a rival of other annual publications, either foreign or domestic. Details as to elections, the *personnel* of state and municipal governments, political personalities, societies, and educational, literary, and scientific institutions have deliberately been reduced, in order to make room for material of a kind not found in most of the annuals. The American Year Book appeals first of all to students in all fields, who wish a record of progress, not only in their own, but in other departments of human endeavor. It is intended, also, as a handbook for busy men, editors, contributors, professional men, teachers, scientific workers, engineers, practical and business men, who wish to verify or confirm points that arise in their minds; and to serve as a handy body of reference material settling questions of fact. Throughout the work the object has been to make the volume convenient for the user; hence the Year Book is arranged on a plan entirely unique in publications of this general character. It is intended to make reference easier by subdividing material into departments, by putting cognate subjects into close association, and by liberal cross-references, making it easy to turn at once to the discussions relating to any subject. A full and carefully analyzed index is also provided in order to open up all remote connections and relations of a topic. This arrangement by groups of affiliated subjects, instead of haphazard or alphabetical succession of topics, is more convenient, and at the same time more scientific."

The Supervisory Board of representatives of national learned and scientific societies, officially known as the American Year Book Corporation, continues actively to assist in the preparation of the YEAR BOOK. The members of this Board, which originally projected the work, remain individually responsible for the scope and content of the reviews of their respective fields; several are themselves contributors; many have coöperated with the Editor in securing contributors; and all have assisted the Editor with criticism and counsel. The Supervisory Board has now forty members, representing forty-four societies.

One hundred and seventeen contributors have coöperated in the preparation of this issue. All are experts in their special fields, and the complete list printed on a subsequent page contains many names of eminence.

The outstanding feature of the present issue, of course, is the history of the collapse of the Central Powers in the war and the triumph of the allied democracies. Scarcely less important is the survey of the mobilization of the United States for war and of American achievements both at the front and behind the battle lines. An article of especial interest and permanent value reviews the organization and function of the civilian agencies created by the Federal Government for the prosecution of the war. Notwithstanding the emphasis on war problems, however, no element of our normal, peaceful life has been slighted, and the volume carries the customary comprehensive review of American events and progress in politics, economics, sociology, the sciences, the arts, and the humanities.

The acknowledgments of the Editor are due, not only to the contributors and members of the Supervisory Board, but also to the many public officials, Federal, state, and municipal, who have courteously responded to requests for statistical and other data, and to the readers who have offered disinterested criticism of previous issues.

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THE
AMERICAN YEAR BOOK
A RECORD OF EVENTS AND PROGRESS

I. AMERICAN HISTORY

CONGRESS AND ADMINISTRATION

EDWARD M. SAIT

THE SIXTY-FIFTH CONGRESS, SECOND SESSION

The Executive and Congress.—The second session of the Sixty-fifth Congress opened on Dec. 3, 1917, and ended on Nov. 21, 1918. In his annual message, delivered before the two houses on Dec. 4, 1917, President Wilson recommended that Congress declare the United States in a state of war with Austria-Hungary (*A. Y. B.*, 1917, p. 47). In the most decisive language he pledged the resources of the country to the task of prosecuting the war to complete victory:

> Nothing shall turn us aside from it until it is accomplished. . . . Those who desire to bring peace about before that purpose is accomplished I counsel to carry their advice elsewhere. We will not entertain it. We shall regard the war only as won when the German people say to us, through properly accredited representatives, that they are ready to agree to a settlement based upon justice and the reparation of the wrongs their rulers have done.

Should the German people continue after the war to accept the rule of their present masters, "it might be impossible to admit them to the partnership of nations which must henceforth guarantee the world's peace."

On Dec. 7 both houses adopted a war resolution.

The only vote cast against it was that of Meyer London, a Socialist Representative from New York.

In the course of the session the President several times appeared before Congress either to urge legislation or to acquaint the members with particular aspects of foreign relations. On Jan. 4 he asked Congress to enact a measure safeguarding the interests of stockholders and bondholders during the period of Federal control of the railroads. On Jan. 8 he described the war aims of the Allied Governments and laid down his famous 14 points (see II, *International Relations*). On Feb. 11 he gave his reply to the peace speeches of the German and Austrian Ministers of Foreign Affairs. On May 27, in the face of determined opposition, he urged the enactment of a new revenue law during the session. On Sept. 30, appearing before the Senate alone, he declared that the woman-suffrage amendment should be adopted as "a vitally necessary war measure." On Nov. 11 he announced the terms of the armistice which ended the war.

But it was not only through formal addresses that the President exerted influence upon Congress. In spite of the heavy burden resting upon him with his responsibility for the direction of American effort in the war, he found time for frequent consultations with Democratic leaders in Senate and House, and the letters which he wrote in support of or in opposition to the measures before Congress had a considerable effect in fixing the course of legislative business. It would be safe to say that never—not even in the preceding session—has the executive will had a freer play in legislation. Except in the matter of criticism directed against the conduct of the war, Congress did nothing by itself. It waited for the word; it carried out orders almost to the letter. But there were a few occasions on which the President met with stubborn resistance. His contest with the Senate Committee on Military Affairs and especially with its chairman, Mr. Chamberlain of Oregon, who wished to erect a War Cabinet and a new Department of Munitions, will be described later. In this case the President eventually had his way. On the other hand he failed to convert the Senate to support of the woman-suffrage amendment, although he based his plea on war necessity; he failed equally to persuade the House to abandon its absurd system of distributing appropriation bills among eight different committees. Several times he had recourse to the veto. He vetoed the legislative, executive, and judicial Appropriation bill on July 1 because of a rider which extended the working day of Government employees from seven to eight hours. He vetoed the Post Office Appropriation bill on June 29 because of the provision made for continuing the use of pneumatic mail tubes in the large cities. He vetoed the Agricultural Appropriation bill on July 12 because of a rider fixing the price of 1918 wheat at $2.40 a bushel. In none of these cases was the veto overridden.

As to the controversy over wheat prices the facts are briefly these. On Feb. 23 the President issued a proclamation continuing for 1918 $2.20 as the price at the central markets. In explaining the proclamation he then said:

> This guaranteed price assures the farmer of a reasonable profit even if the war should end within the year, and the large stores of grain in those sections of the world that are now cut off from transportation should again come into competition with his products. To increase the price of wheat above the present figure, or to agitate any increase of price, would have the effect of very seriously hampering the large operations of the nation and of the Allies by causing the wheat of last year's crop to be withheld from the market. It would, moreover, dislocate all the present wage levels that have been established after much anxious discussion and would, moreover, dislocate all the present wage which would be harmful to every industry in the country.

In spite of this declaration the Senate proceeded on March 21, by a vote of 49 to 18, to fix a price of $2.50. Since the House refused to accept this rider and the Senate conferees stood fast, a long deadlock ensued. It was broken on July 6 by the acceptance of a compromise fixing the price at $2.40. Six days later the President sent his veto message to the House. He pointed out that the existing price had stimulated production, that "our granaries are likely to overflow, and the anxiety of the nations arrayed against Germany with regard to their food supplies has been relieved." He also asserted that the $2.40 price would add $2 a barrel to the price of flour. A little later Senator Gore of Oklahoma attacked the President, declaring that his views were swayed by "courtier farmers."

> They whispered to him what was pleasing to his ear, and did not tell him the truth. . . . These courtier farmers, swinging incense before the President, told him that it was the essence of justice and fairness that a farmer be given 80 cents less a bushel than he could get in the open market.

It cannot be said that the performances of Congress during this session did anything to enhance its prestige. Congress displayed almost no initiative; all the great war measures came from the Administration. Nor is there reason to believe that the country looked for initiative; its inclination was rather to inquire how far Congress had responded to the President's recommendations, how far it had acquiesced in his leadership. This atrophy of the legislature might be illustrated in many ways. It is significant, for instance, that when the railroads were apparently breaking down under private management, Congress seemed oblivious of the fact; Congress made no move. It waited until the President, seeing the necessity of Federal control during the emergency of the war, told it what to do. The members of both houses were fully conscious of the subordinate *rôle* which they were playing. They made that plain in the debates. Said Senator Johnson on July 6:

> Even though we have fallen from the high estate of the senate of other days, we may be able to play some part and give some aid by staying here and attending to what business we have. . . . I admit we have lost our initiative and have become merely a rubber stamp, but possibly we can be of some use.

On April 20 Senator Harding said: "They speak contemptuously of Congress. An Assistant Secretary had the effrontery to say the other day that the Administration could get along very well in the conduct of the war if it were not for the interference of 'numskulls on Capitol Hill.' From time to time, when the Administration brought in its bills and asked for immediate action, resentment was manifested. "I believe the time has come to definitely impress upon the country and upon the Executive that we propose to do some thinking for ourselves," Mr. Longworth said during the debate on the War Finance bill; "that we propose to conduct ourselves as the legislative representatives of the American people and not simply as the amanuensis of those holding executive offices." Protests of this kind were not uncommon, but they served to indicate the presence of a malady rather than to assuage it.

Responding to the spur, Congress accomplished a good deal in the way of war legislation. It regulated executive control of the railroads and of wire and radio communications. The Overman Act authorized the President to coördinate and consolidate all governmental activities during the war; the Sedition Act imposed penalties for the circulation of false statements, abuse of the Government, etc.; the Sabotage Act was directed against the destruction of war material; the War Finance Corporation Act provided Government assistance in the financing of war industries; the Man Power Act extended the period of liability to the draft, including all between the ages of 18 and 45. Enormous appropriations and authorizations were made for both army and navy. While Congress showed little capacity in dealing with war problems, it took an independent line in regard to the regulation of the liquor traffic. By an amendment to the Food Stimulation bill it provided for absolute nationwide prohibition after June 30, 1919, and on this subject it refused to accept the advice of the President and of the Department of State. The attitude of Congress towards this question was determined by pressure exercised from outside. But the activity of the Senate Committee on Military Affairs in investigating the conduct of the War Department stands out prominently as the one real contribution which Congress made towards stimulating the executive and realizing a more effective war programme.

The War Department Under Attack.—On Dec. 12, 1917, the Senate Committee on Military Affairs began an investigation into the alleged shortcomings of the War Department. This investigation revealed many instances of mismanagement, such as the failure to provide arms, uniforms, blankets, and adequate hospital facilities. Secretary Baker defended the Department at length on Jan. 10 and 11, admitting that mistakes had been made, but maintaining that these were of slight account in comparison with the achievements. He explained how the military forces had been increased in nine months from about 212,000 to 1,540,000. In the course of the hearing he said:

> The training of the army is proceeding rapidly and its spirit is high. The subsistence of the army has been above criticism; its initial clothing supply, temporarily inadequate, is now substantially complete, and reserves will rapidly accumulate. Arms of the most modern and effective kind—including artillery, machine guns, automatic rifles, and small arms—have been provided by manufacture or purchase for every soldier in France, and are available for every soldier who can be gotten to France in the year 1918. . . .
>
> Great programmes for the manufacture of additional equipment and for the production of new instruments of war have been formulated.
>
> No army of similar size in the history of the world has ever been raised,

> equipped, or trained so quickly. No such provision has ever been made for the comfort, health, and general well-being of an army. The health reports for December, for a variety of reasons, became suddenly less favorable than for the preceding months; but the unfavorable conditions have been met and improvement is already apparent.

The Committee did not feel disposed to take such an optimistic view. According to Senator Wadsworth of New York, Secretary Baker's statement

> created the impression throughout the country that the future is rosy, that conditions are fine, and that there is no need of urgent haste. I believe that the facts are that the United States faces one of the greatest crises in its history because of the shortage of artillery. . . . I think, Mr. Secretary, that your statement has created a wrong impression among the people.

And Senator Chamberlain of Oregon, chairman of the committee, said:

> I feel that your statements before this Committee have given a false impression. You have told us that the army is fully equipped. Now, the evidence before this Commitee runs to the contrary. We have the word of many witnesses of shortage in clothing and munitions.

In addresses which he delivered in New York on Jan. 19 Mr. Chamberlain spoke with still greater emphasis. He said:

> Now, in conclusion, and I have only touched a few of the high spots, let me say that the military establishment of America has fallen down. There is no use to be optimistic about a thing that does not exist.
>
> It has almost stopped functioning, my friends. Why? Because of inefficiency in every bureau and in every department of the Government of the United States. We are trying to work it out. I speak not as a Democrat, but as an American citizen.

President Wilson, after learning that these remarks had been faithfully reported in the press, issued a reply on Jan. 21:

> Senator Chamberlain's statement as to the present inaction and ineffectiveness of the Government is an astonishing and absolutely unjustifiable distortion of the truth.
>
> As a matter of fact, the War Department has performed a task of unparalleled magnitude and difficulty with extraordinary promptness and efficiency. There have been delays and disappointments and partial miscarriages of plan, all of which have been drawn into the foreground and exaggerated by the investigations which have been in progress since the Congress assembled—investigations which drew indispensable officials of the department constantly away from their work and officers from their commands and contributed a great deal to such delay and confusion as had inevitably arisen. . . .
>
> To add, as Senator Chamberlain did, that there is inefficiency in every department and bureau of the Government is to show such ignorance of actual conditions as to make it impossible to attach any importance to his statement. I am bound to infer that that statement sprang out of opposition to the Administration's whole policy rather than out of any serious intention to reform its practice.

Three days later Mr. Chamberlain sought to justify his statement in a speech before the Senate. He said:

> The President did not know the truth, but I did. The President naturally obtained his facts from the Secretary of War, and the Secretary of War gave them to him as he received them from subordinates, with no intention to deceive. But if subordinates gave the information, they lied.

The Senator proceeded to support his contentions by testimony given before the Committee.

Meanwhile Mr. Chamberlain had brought foward two bills: (1) a bill to establish a new Department of Munitions for the duration of the war, the director having a seat in the Cabinet and being entrusted with complete control over every sort of supplies for Army and Navy, and (2) a bill to establish a War Cabinet. The latter bill provided that

> there is hereby created a War Cabinet, to be composed of three distinguished citizens of demonstrated ability to be appointed by the President, by and with the advice and consent of the Senate, through which War Cabinet the President may exercise such of the powers conferred on him by the Constitution and the laws of the United States as are hereinafter mentioned and described.

The War Cabinet was to have sweeping powers. It would be superior to all members of the Government except the President, its acts being subject to his review. Its functions were to cease six months after the close of the war. These measures provoked lively debates in the Senate. There were Democrats besides Senator Chamberlain—notably Mr. Hitchcock of Nebraska—who argued warmly for their passage. The President, however, as well as the Secretary of War, expressed strong disapproval; to meet some of the criticism heard before the Committee the President appointed Edward R. Stettinius of J. P. Morgan & Co. as Surveyor-General of Army Purchases; and an Administration bill was drafted to give the President a free hand in reorganizing the departments. The passage of this bill killed the Chamberlain measures.

The Overman Act.—Early in February, while criticism of the War Department still continued and while Senator Chamberlain, against the wishes of the President, was still bent upon establishing a War Cabinet and a separate Munitions Department, the Administration through Senator Overman brought before the Senate a reorganization bill of its own. This bill empowered the President to coördinate and consolidate all governmental activities during the emergency of the war and to create additional agencies with such powers as he should deem appropriate. In scope it went far beyond any other legislation since the beginning of the war. Frank amazement was expressed at the Capitol that Congress should be invited to abdicate its powers in so general a fashion. "If this bill passes," said Senator Smoot of Utah, "there would be only one more thing left for Congress to do, and that would be to make the President a king. . . . It is inconceivable that Congress would pass such a measure." Senator Gallinger of New Hampshire said: "Whether or not we are going to turn the government from a democracy to an autocracy is the question which is going to be discussed very largely for some days to come." Senator Martin, the Democratic floor leader, was quick to announce that when asked by the Postmaster-General to introduce the bill, he had declined. On both sides of the Senate the view seemed to prevail that, even should Senator Overman secure a favorable report from the judiciary committee, the bill had no hope of final passage.

For six weeks it remained in the hands of the Judiciary Committee. Two Democrats, Hoke Smith of Georgia and Reed of Missouri, opposed it bitterly, demanding radical changes which would circumscribe the powers conveyed to the President; they were especially bent upon withholding from him the power to interfere with the Interstate Commerce Commission, the Federal Reserve Board, and other agencies of a similar kind. On March 20, however, the Committee reported the bill favorably by a vote of 11 to 7; three Republicans (Borah, Colt and Nelson) voted with the majority, two Democrats (Reed and Smith) with the minority. The only important changes made in the Committee were these: that the acts of the President in reorganizing the departments should take the form of written orders; that his authority under the bill should be exercised only in matters relating to the conduct of the war; that the consent of Congress must be obtained for the abolition of any existing bureau; and that the clause granting the President power to create new agencies should be eliminated. In reporting the bill Senator Overman frankly admitted that the President had asked for the authority with which it was now proposed to invest him. When Senator Cummins expressed doubts as to the existence of any formal message on the subject, Mr. Overman replied: "I said it was the same as a message in writing. The bill was advocated by the President and sent to me by the President, and I have no hesitation in saying so."

With the opening of debate Senator Reed subjected the bill to vigorous attack. Hoke Smith followed him a few days later. It was in these circumstances that President Wilson wrote to Senator Overman on April 21: "I thank you with all my heart for standing by the bill which bears your name without any compromise of any kind." This seemed to strengthen the Administration forces. Almost at once Senator Chamberlain, insistent critic of the War Department, announced that he would support the bill. But Republican hostility by no means diminished. On April 23 Senator Sherman of Illinois assailed the Cabinet in terms of unusual rancor. He described Secretary Baker, Secretary Burleson, and others as "Socialists and economic freaks";

he declared that the President had surrounded himself with advisers who were "half-pacifists, firebrands, and friends of sedition . . . a mysterious bunch of wizards." Senator Brandegee of Connecticut denounced the bill as "outrageously unconstitutional." Many Republicans, however, made up their minds to vote with the Democrats, some (like Senator Fall of New Mexico) with the idea of fixing responsibility on the President and correcting the impression that Congress was tying his hands. On April 27, when the Senate rejected Hoke Smith's amendments exempting the Interstate Commerce Commission and the Federal Reserve Board from the operation of the Act, the majority included a quarter of the Republicans; and on April 29, when the Senate adopted the bill by a vote of 63 to 13, the majority included 21 Republicans. One Democrat, Reed, opposed the bill to the last.

In the House debate began on May 13 and proceeded for a few hours in a listless and perfunctory way. Resistance was felt to be quite hopeless. The vote, taken next day, was 295 to two (Gillett of Massachusetts and Sterling of Illinois).

The bill, as approved on May 20, differed very little from the original measure presented by the Administration. The chief amendments made in the Senate Committee have been noted above; the House made no amendments. The Act authorized the President

> to make such redistribution of functions among executive agencies as he may deem necessary, including any functions, duties, and powers hitherto by law conferred upon any executive department, commission, bureau, agency, office, or officer, in such manner as in his judgment shall seem best fitted to carry out the purposes of this Act.

The bill remains in force until six months after the proclamation of peace. (See also *War Organization, infra.*)

Federal Control of Railroads.—On Jan. 4, one week after the Federal Government had taken possession of the railway lines of the country (*A. Y. B.*, 1917, p. 533), the President, appearing before Congress, recommended legislation to safeguard the interests of stockholders and bondholders. He proposed that railroad properties should be maintained through the period of Federal control at the existing level of repair and equipment; that the roads receive such compensation as would be equitable alike to owners and the general public; and that the compensation be based upon the average net income of the three years ending June 30, 1917. He said:

> I need not point out the essential justice of such guarantees and their great influence and significance as elements in the present financial and industrial situation of the country; indeed, one of the strong arguments for assuming control of the railroads at this time is the financial argument. It is necessary that the values of railway securities should be justly and fairly protected and that the large financial operations every year necessary in connection with the maintenance, operation, and development of the roads should, during the period of the war, be wisely related to the financial operation of the government.

An Administration bill embodying the recommendations of the President's message was introduced simultaneously in the two houses. Both in committee and in debate the bill raised a number of controversial questions. The chief of these were: (1) when the roads should revert to private control, if at all; (2) what the method and rate of compensation should be while the roads remained under Government control; and (3) where the rate-fixing power should be lodged. The Senate committee on Interstate Commerce modified the bill in two important particulars. While giving the President power to fix rates, it provided that these rates might, upon appeal, be disallowed by the Interstate Commerce Commission. It also limited Federal control to a period of 18 months after the conclusion of the war, whereas the original provision had permitted it to continue indefinitely until terminated by Congress. A minority report, presented by Senator Poindexter of Washington, took issue with both these proposals, maintaining that the Interstate Commerce Commission should not be divested of its existing powers of rate regulation and that a period for the termination of Government control should not be fixed "without making any provision whatever for removing the notorious abuses and inefficiencies of the present system of private competitive ownership and operation." In the course of debate Senator Johnson of California said (Feb. 19):

> I object to the 18 months' period as substantially establishing at this time a policy of the return of the roads and as substantially precluding the policy of Government ownership after the war. . . . This bill does, in effect, tie our hands, establishing not alone our present intention, but our future policy, and this is neither wise nor statesmanlike.

Senator Poindexter urged a referendum after the war on the question of Government ownership. Senator Sherman of Illinois, on the other hand, spoke strongly against Government ownership, fearing that the railroad employees, with a compact organization, would be able to force their will upon Congress. Senator Cummins of Iowa directed his criticisms mainly against the rate of compensation which the roads would receive—at least $175,000,000 a year, he declared, in excess of what was just and reasonable.

> It cannot be possible that Congress will tax the people of the country, either through rates for transportation or through other impositions, to pay the returns upon capital stock, the most of which was issued in defiance of both law and morals.

On Feb. 22 the Senate rejected by large majorities amendments which would have limited the compensation of railroads to five per cent. on capital stock (offered by Senator Cummins); took from the President the power to initiate rates (offered by Senator Cummins); and reduced the period of Government control to six months after the close of the war (offered by Senator Lodge of Massachusetts). One of Senator Cummins' amendments, bringing every competitive short-line railroad under Federal control whether designated by the Director-General of Railroads or not, was adopted by a vote of 58 to 14. The bill passed the Senate without a roll call, the Administration forces having been victorious on practically all contested points.

In the House Committee on Interstate and Foreign Commerce, which reported the bill on Feb. 9, there was a sharp cleavage of opinion mainly coincident with party lines. Eight of the nine Republican members wished to leave the rate making power of the Interstate Commerce Commission undisturbed and to limit the period of Federal control to one year after the close of the war; but in the majority report the President was given final authority in fixing rates and the period of control was extended to two years. Mr. Sims of Tennessee, chairman of the Committee, said in reporting the bill that "it is inconsistent with the public interest to allow a war control, admittedly assumed for emergency purposes only, to extend indefinitely in time of peace." He conceded, however, that the country might "never be willing to have the carriers go back to the old system," and that "some programme of constructive, far-reaching policy ought to be worked out before the railroad properties are returned to private control." In the House the same controversial questions were debated as in the Senate but without arousing such a wide public interest. The bill passed on Feb. 28, substantially as recommended by the Committee, by a vote of 337 to six. Rate making was left to the President absolutely by a vote of 211 to 165, although earlier, by a vote of 164 to 157, the House had entrusted that authority to the Interstate Commerce Commission.

The conference report, adopted by the Senate on Feb. 13 and by the House on Feb. 14, adhered mainly to the provisions of the Senate bill; there was a compromise on the period of Government control, this being limited to 21 months after the close of the war. The Act, as signed by the President on March 21, is "expressly declared to be emergency legislation, enacted to meet conditions growing out of the war" and not to be construed as "expressing or prejudicing the future policy of the Federal Government concerning the ownership, control, or regulation of carriers or the method or basis of capitalization thereof." It provides that the roads shall return to private control 21 months after the proclamation of peace unless the President shall decide to relinquish them earlier; that the owners shall be compensated at a rate based upon the average earnings for the three years ending June 30, 1917, with all obligations and upkeep guaranteed by the Government; that the authority to establish rates shall be vested in the President, with the Interstate Commerce Commission exercising final jurisdiction when complaint or protest is made; that short-line railroads, whether competing with other lines or not, shall be considered as within Federal control; and that a revolving fund of $500,000,000 shall be set aside to pay the expenses of Federal control, compensate the railroad, purchase new equipment, etc. (See also XIX, *Railroads.*)

Federal Control of Telegraphs and Telephones.—On June 30 the president of the Commercial Telegraphers' Union of America announced that 25,000 employees of the Western Union Telegraph Co. would strike on July 8. This decision was taken because the Company had locked out 800 employees and refused to abide by a decision of the National War Labor Board, the main question at issue being the right of the men to organize. Partly because of this labor unrest, partly because of considerations arising out of the war, a joint resolution giving the Government authority to control the wire and radio systems was introduced in the House. This resolution read:

> To insure the continuous operation of electrical communicating systems, to guard the secrecy of war dispatches and prevent communications between public enemies:
>
> Resolved, By the Senate and House of Representatives of the United States of America, in Congress assembled, that the President, if in his discretion it is deemed desirable, in order to insure their continuous operation, or to guard the secrecy of military and Governmental communications, or to prevent communication by spies and other public enemies thereon, or for other military or public reasons, shall have power to take possession and control of any telegraph, telephone, marine cable or radio systems, and operate the same subject to those conditions of law, so far as applicable, which are in force as to steam railroads while under Federal control.

The original resolution before the House Committee on Interstate Commerce, therefore, placed no time limit upon Government control. The President endorsed it; so did members of the Cabinet who appeared before the Committee; the latter, and especially Postmaster-General Burleson, believed that it was most desirable to leave the way open to permanent Government operation under the Post Office Department. The Committee, however, finally took a different position, and after considering various proposals adopted a substitute resolution, offered by Mr. Sanders of Louisiana, which limited Government control to the period of the war and guaranteed to the companies just compensation. President Wilson accepted this substitute and urged Democratic leaders to secure its immediate passage. There was at first some Republican opposition. Said Mr. Gillett of Massachusetts, Republican floor leader:

> The Postmaster General is the last man most of us would turn to to improve the telephone service. Furthermore, we do not know that the Cabinet officers are in favor of this bill. It is not the one they recommended. . . .
>
> We have had no good reason furnished why we should pass it. If the President wants it he should send word to Congress in the way provided by the Constitution, and not send it in a roundabout way by the telephone and through his secretary. In a momentous question of this kind, where we have no means of knowing the necessity for it, it would be much better if the President expressed his wishes in the regularly constituted way. We have a right to expect to receive the information in that way.

But the resolution passed on July 5 by a vote of 221 to four, these four being Republicans from the Middle West.

The Senate at first showed no disposition to act promptly, as the President desired. It went so far as to adopt a resolution to adjourn until Aug. 12; but when the House refused to concur in this action, the Senate postponed recess and gave its attention to the question of wire control. On July 9 the committee on Interstate Commerce, by a vote of seven to three, decided to report the House resolution at once but without favorable recommendation. Next day, however, it made a favorable report. The Senate passed the resolution on July 13 by a vote of 46 to 16; the majority included 35 Democrats and 11 Republicans; the minority was composed entirely of Republicans. Among the opponents of the resolution the most prominent was Senator Wadsworth of New York. He maintained that the Administration had failed to give Congress

> the slightest reason why wire communications ought to be put in the hands of the Government. We have passed war legislation here that the President wanted, and have been content to do it when the reason was explained to us. This is the only measure put before us in which we have been asked merely to pass it, without knowing the reason why.
>
> The Secretary of War, the Secretary of the Navy, and the Postmaster-General appeared before the House Committee and failed to give any reason why the resolution should be passed. They assume the attitude that Congress did not need to know, that it was unnecessary for Congress to try to inform itself.
>
> I say there is a mystery surrounding the genesis of this resolution for Government control of the wire communication. No man in Congress has been able to point out any emergency that exists for it or that may confront the country in the future.
>
> What, then, is the motive behind it? I want to say to the Senate that I believe there are men in high places in our Government who are determined that the railroads, taken over in wartime, shall be conducted after the war as Government property and who are bound that they shall be politically controlled. They intend that they shall never go back to the private owners.

Senator Harding of Ohio also spoke strongly against the measure. It was signed by President Wilson on July 16. (See also XIX, *Telegraphs and Telephones.*)

The War Finance Corporation Act.—On Jan. 28 Secretary McAdoo made public the provisions of a bill which, prepared under his direction, would extend Government credit to persons and corporations engaged in business necessary to the prosecution of the war. The bill created a War Finance Corporation, with a capital of $500,000,000 (all subscribed by the United States) and with a board of directors consisting of the Secretary of the Treasury and four others appointed by him with the approval of the President. The life of the Corporation was to be ten years. It was to have power to issue notes or contract obligations up to the amount of $4,000,000,000; to make advances to banks which had helped to finance undertakings necessary to the prosecution of the war, or, in exceptional cases, to make advances directly to such undertakings; and to license or refuse to license any sale of securities in excess of $100,000. On Feb. 4 this bill was introduced in both houses.

The Secretary of the Treasury explained his proposals before the Senate Finance Committee. "The main purpose of the measure," he said, "is to keep the financial field clear for Government borrowings and at the same time aid industries engaged directly or indirectly in war work." In reply to the convention that the directors of the Corporation should be appointed by the President rather than by himself, Mr. McAdoo made this frank statement:

> If it is known that the President is to make appointments to a board of this character, with its tremendous power, Senators and others would bring political pressure to bear upon him to appoint men from their own States. That's the plain fact. Appointments by the President and confirmation of them by the Senate always have a tendency to result in political pressure being attempted.

On Feb. 28, however, after debate had proceeded some days in the Senate, an amendment was adopted transferring the power of appointment to the President and Senate. Next day another amendment was carried; it required that "no director of the Corporation shall participate directly or indirectly in any transaction with the Corporation which affects any concern in which he is directly or indirectly interested." This was not a radical departure from the original bill so much as the strengthening of a provision already existing. Nevertheless, it indicated a critical attitude, and opposition, especially to the clause regulating security issues, steadily developed. On March 4, Hollis of New Hampshire and Owen of Oklahoma announced that they would lead a filibuster against the bill unless certain changes were made in it. The Finance Committee reluctantly gave way, sanctioning amendments which greatly reduced the power of the Corporation in supervising the issue of securities and stripped its decisions in that field of all compulsive authority. On March 7 the Senate passed the bill by a vote of 74 to three, the minority consisting of Hardwick of Georgia, Democrat, and Harding of Ohio and Sherman of Illinois, Republicans.

In the House the bill went to the Committee on Ways and Means because the members of the Committee on Banking and Currency, to which it normally would have been referred, were so hostile to it. The Committee made one important change in the Senate bill; it reduced from four billion to two billion the amount of bonds which the Corporation might issue in aid of War industries. Debate in the House, considering the character of the bill, was surprisingly lanquid; no serious opposition showed itself. The final vote, taken on March 21, was 369 to two (La Follette of Washington and Mason of Illinois). In conference the Senate amendments mentioned above were accepted; and the maximum bond issue was placed, by way of compromise, at $3,000,000,000. The Act, approved on April 5, follows the lines of the original measure except in the instances noted and in matters of detail. (See also XII, *The Conduct of Business.*)

The Sedition Act. — This amendment to the Espionage Act of 1917 (*A. Y. B.*, 1917, p. 12), prepared by the Department of Justice and introduced in the House in the middle of January, was primarily intended to provide more adequately against seditious activities during the Third Liberty Loan campaign. The House passed the bill, with slight modifications, on March 4; but such were the delays in the Senate that the bill did not reach final passage until the loan campaign had drawn to a close; indeed, it was not reported from the Senate Judiciary Committee until April 2. For a week there was acrimonious debate. Senator Johnson of California denounced the measure as one designed "to suppress the freedom of the press in the United States and to prevent any man, no matter who he is, from expressing legitimate criticism concerning the present Government." On the other hand there were those who advocated the death penalty for traitors and German propagandists. Senator Watson denounced George Creel, chairman of the Committee on Public Information, for radical articles published before the war; and Senator Borah said of Victor Berger, a leading Wisconsin Socialist and candidate for Congress, that he could not think of "a more despicable and contemptible creature under the protection of the American flag."

Four amendments of importance were adopted. The Thomas amendment inserted the word "willful" in the provision against writing "disloyal, profane, scurrilous, or abusive language" about the Government and institutions of the country. The France amendment, first rejected in committee of the whole by a close vote and next day adopted in the Senate without roll call, provided that "nothing in this act shall be construed as limiting the liberty or impairing the right of any individual to publish or speak what is true, with good motives and for justifiable ends." The Jones amendment provided for the dismissal of Federal executive employees guilty of committing disloyal acts or making disloyal statements; this was a substitute for an amendment introduced by Senator Penrose of Pennsylvania after attacks had been made upon the chairman of the Committee on Public Information. The King Amendment authorized the Postmaster-General to refuse delivery of mail to any person who, in his opinion, had used the mails in violation of the Act. The amended bill passed the Senate without a roll call on April 10.

Almost a month elapsed before the adoption of the conference report, a report which eliminated the France amendment while retaining the other three. Radical members of the Senate condemned the postal censorship; Senator Borah of Idaho declared that "we are likely to go so far . . . as to protect venality and corruption and profiteering and treason if it is sufficiently wise to come to Washington and offer to serve the Government and wrap a sufficient number of American flags around itself before it comes." There was also an insistent, though unsuccessful, demand for the retention of the France amendment. The Department of Justice and the War Intelligence Bureau, however, opposed it on the ground that it would place too heavy a burden on the prosecution. Senator Fall of New Mexico expressed the opinion that should it be embodied in the Act, every offender would come to court with the plea of truth and good motives and that in the exercise of the right to prove his contention he "would have unlimited opportunity to explain his views, and more harm would probably come from the trial than from the original offense." Finally, on May 4, the conference report was adopted by a vote of 48 (including 11 Republicans) to 26 (including two Democrats). Three days later it was adopted by the House, with only one dissentient voice, that of London (Socialist) of New York.

The Act (approved May 16) imposes a fine of not more than $10,000 or imprisonment for not more than 20 years or both upon persons who willfully make false reports or statements with intent to interfere with the operation or success of the military or naval forces; who incite insubordination in those forces or obstruct enlistment; who use abusive language about the Government or institutions of the country, who advocate or incite any curtailment in the production of war materials; and who by word or act favor the cause of an enemy country. It also provides for the dismissal of any Government employee who commits disloyal acts or utters disloyal language; and it empowers the Postmaster-General to refuse delivery of mail matter to any person who, he has reason to believe, is using the postal service in violation of the Act.

The Sabotage Act.—In April, 1917, the Senate passed a bill to punish the destruction or injury of war materials and war transportation facilities, as well as to prevent the hostile use of property in time of war. Almost a year later, on March 6, this bill was reported to the House. Mr. Cannon, the former Speaker, offered an amendment imposing the heavy penalties of the Act upon

> whoever with intent to injure, interfere with, or obstruct the United States or any associate nation in preparing for or carrying on the war shall conspire to prevent the erection or production of such war premises, war material, or war utility.

This amendment was apparently intended to prevent strikes among the workers in war industries. Under the closure it passed the House by a vote of 255 to 59. At once Mr. Lunn of New York proposed another amendment which recognized the right of collective bargaining even in war industries:

> Nothing herein shall be construed as making it unlawful for employees to agree together to stop work or not to enter thereon with a *bona fide* purpose of securing better wages or conditions of employment.

In explaining the object of his amendment, Mr. Lunn expressed the opinion that "this bill unamended can be used by reactionary judges to forbid men from striking, however just the cause," and that "with the Cannon amendment it conscripts labor, as I interpret it." Under the closure and without debate this amendment also carried, by a vote of 272 to 38. The fact that in both cases more than 110 members were recorded as "not voting" indicated the embarrassment of the House in dealing with such a delicate question. The final vote on the bill was 321 to none.

In conference the House refused to give way on the amendments; and this attitude provoked in the Senate a debate in which Calder of New York, Thomas of Colorado, Underwood of Alabama, and others took a determined stand against the exemption of labor strikers. Williams of Mississippi regarded the Lunn amendment as superfluous and as likely to encourage the agitation of the Industrial Workers of the World. The interests of labor were not undefended, however. Senator Pittman of Nevada said: "You are conscripting labor. Are you ready to conscript the employer? I am ready to conscript both of them, but I am not ready to conscript the employee and not conscript the employer." Senator Hollis of New Hampshire said: "I wish to state to the Senate in all seriousness that it is not necessary to have a conflict with labor and it is not necessary to declare martial law and shoot laboring men." Senator Overman of North Carolina urged an immediate vote, remarking that the bill had passed the Senate a year ago and was "the most important bill that has been before Congress." As a result of the vote the conference report was rejected by 34 to 25, with 36 not voting.

The conferees of the two houses continued to meet. On April 15, apparently influenced by a letter of Samuel Gompers, President of the American Federation of Labor, which expressed the hope that both the Cannon and Lunn amendments would be retained or both eliminated, they decided on the latter course. Both houses acquiesced in this decision. The bill was approved on April 20.

The act imposes a maximum fine of $10,000 and a maximum term of imprisonment of 30 years, or both, in the case of those who wilfully destroy war materials or war premises or utilities used in connection with war material (such as railroads, canals, piers, bridges); and it imposes the same penalties in the case of those who wilfully make or cause to be made in a defective manner any war material or instruments used in the production of war material.

Military and Naval Legislation.— In view of the expanding effort of the United States in the war Congress was called upon not only to make enormous appropriations for the Army and Navy, but also to modify provisions of the military laws from time to time. In May the basis of the draft quota was changed. It had been based upon state populations; but the defects of this arrangement, viewed from the standpoint of the unequal distribution of aliens among the states, had been made evident by experience under the original draft. Congress therefore made the quota of each state depend upon the number of men assigned to Class I. While the resolution was being debated the War Department, supported by a letter from the President, successfully opposed an attempt to carry an amendment which would have given credit in the draft for voluntary enlistments. Advocates of the amendment had urged that failure to give such credit would discourage volunteering and patriotic impulses; but on the other side it was maintained that the states actually did receive credit for volunteers because, if these had been included in Class I, the state quota would have been enlarged correspondingly. Another resolution, approved May 20, extended the provisions of the draft law to young men reaching the age of 21 after June 5, 1917, when the draft law went into force. The expectation that between 700,000 and 1,000,000 men would thus be made available in the first year afterwards proved to be ill-founded because so many of this group had joined the Army or Navy as volunteers.

Two measures of far greater importance were the Army Appropriation Act and the Man Power Act. On May 3 Secretary Baker laid the plans of the Administration for an increased military establishment before the House Committee on Military Affairs. These plans contemplated having 130,000 officers and 2,168,000 men in the field or in camps by July 1, 1918; and he further asked for a free hand in determining in the future how many men should be drafted into the service. On May 31 the Appropriation bill, framed in accordance with executive proposals, passed the House unanimously. It carried approximately 12 billion dollars. In the Senate the bill encountered some obstacles. Senator Fall of New Mexico offered an amendment under which the draft ages should be 18 to 45 with the proviso that only men over 21 should go to the front, an amendment which he altered, in view of opposition, so as to make the ages 20 to 40. On June 26 Secretary Baker and General March (Chief of the General Staff) intervened, asking that the draft ages be left unchanged pending the preparation of a bill which would be sent to Congress in September. Two days later the Senate rejected the Fall amendment by a vote of 49 to 25. An amendment offered by Senator Hitchcock was adopted; this provided that neutrals who had declared their intention to become citizens might claim exemption from the draft, but that thereby they would forfeit, during the period of the war, their right to obtain full citizenship. The Senate passed the bill on June 29. On July 6 the conference report was accepted by both houses, the bill, as signed on July 10, including the Hitchcock amendment and a House amendment which granted the President unlimited authority to increase the Army by calls under the draft law.

On Aug. 5 an Administration measure commonly known as the "Man Power bill" was introduced in both houses. It proposed to amend the selective-service law so that liability to the draft should fall upon those between 18 and 45 years of age inclusive, registration of young men reaching 18 should be continuous, and the President should be allowed to call out the registered men in classes. This last provision read in the bill: "The President may draft such persons liable to military service in such sequence of ages and at such time or times as he may prescribe"—that is, men between the ages of 32 and 40, for example, before men between the ages of 40 and 45. In the House Committee on Military Affairs an amendment was adopted (the McKenzie amendment) providing that men from 20 to 45 should be called before the younger men and that those of 18 should be called last; and this step was taken in spite of opposition by the War Department. The Senate Committee adopted a "work or fight" amendment, which provided that

> when any person shall have been placed in a deferred or exempted class for any of the reasons in this paragraph set forth, he shall not be entitled to remain therein unless he shall in good faith continue, while physically able to do so, to work at and follow such occupation, employment, or business, and if he fails so to do shall again become subject to the draft; the President shall make regulations for enforcing this provision.

Before the House Committee Frank Morrison, secretary of the American Federation of Labor, opposed the adoption of the Senate "work or fight" amendment. He characterized it as an attempt to conscript labor and as fathered by certain big corporations which he named. He said:

> The Government is not exercised over the industrial situation. But someone is. He is hidden somewhere in the dark. engineering a movement to conscript labor. . . . Will the Government become a strike-breaking agency, using the soldiers who seek to save democracy to defeat workingmen who are also fighting for democracy in the industrial field?

On Aug. 24 the House passed the Man Power bill by a vote of 336 to two (London, Socialist, of New York; Gordon, Democrat, of Ohio). Both the McKenzie amendment and the "work or fight" amendment were rejected.

The Senate, by a vote of 75 to none (Senator Gore first voting in the negative and then being excused from voting) passed the bill on Aug. 27. The "work or fight" amendment was retained by a vote of 40 to 29, with 28 Republicans supporting and six opposing it; but the original provision had in the meantime been modified so as

> not to apply in the case of a strike if the strikers have submitted or will at once submit the dispute to the War Labor Board, agree to abide and do abide by its decision, and do at once resume work and continue work pending such decision. The said board shall take up and decide all such disputes as speedily as practicable.

The conference report, however, accepted by both houses at the close of the month, discarded the amendment. An interesting feature of the Act is the provision which authorized the Secretary of War, under specified conditions, to send soldiers 18 to 21 years of age to educational institutions at public expense (see also XXX, *Education*).

On July 1 the President signed the Naval Appropriation Act, carrying $1,573,468,415, the largest credit ever granted to the Navy in a single measure. The bill authorized a permanent increase in the enlisted strength from 87,000 to 131,485. In passing the bill on May 22 the Senate refused to prohibit the payment of premiums and bonuses to encourage efficient work in Government yards, but it did prohibit the use of "stop-watch" or time-measuring devices. Labor leaders at the Norfolk and Portsmouth yards telegraphed Chairman Padgett of the House Naval Affairs Committee threatening a walkout in case the bonus system were permitted. Mr. Padgett told the House that he did not approve of the course taken by the labor leaders—the employment of a strike threat to influence legislation, but that any legislation at this time might endanger the success of an efficiency system which Secretary Daniels was now applying in the yards. In its final form the bill prohibited the payment of bonuses.

In October Secretary Daniels announced that he would ask Congress to authorize a second three-year building programme providing, like the programme of 1916, for 156 vessels (10 superdreadnoughts and six battle cruisers included). The estimates for 1920, as announced on Nov. 16, aggregated $2,441,000,000; but it was generally understood that the ending of the war would make large reductions possible. (See also XI, *The Navy.*)

On Sept. 17 it was announced that deficiency estimates prepared by the War Department called for an appropriation of more than $7,347,000,000. The largest items were: transportation, $1,277,854,000; fortification and armament, $1,985,075,000 (largely for expenditure in Europe). The Committee on Appropriations made a good many cuts in the estimates, and the bill as passed at the end of October carried only $6,345,500,000 this amount including $107,277,000 for the Navy. The Fortifications Appropriation Act, passed in the summer, carried over $5,300,000,000. (See also IV, *Appropriations.*)

The War Revenue Bill.—In May the Secretary of the Treasury indicated to Congressional leaders the necessity of passing a new revenue law before the end of the session. Determined opposition at once showed itself in Congress. It was contended that a readjustment of taxation would not be needed until the spring of 1919 and that a better revenue bill could be framed then because the financial situation of the Government would be better known. Most Congressmen, however, were moved by other considerations. In view of the approaching campaign they were anxious to have an early adjournment and to avoid questions which might injure their prospects for reëlection. President Wilson, recognizing the force of this sentiment, expressed his readiness to let the proposed bill hold over until a special session beginning Nov. 11, provided the leaders of both parties would undertake to have it ready for his signature by the middle of January. The Republicans refused to accept this plan. Thereupon the President appeared before the houses on May 27 and set forth certain "indisputable facts" on which he based a demand for immediate action. He declared that the present tax laws were marred by inequities which ought to be remedied; that the existing taxation would not support the greatly increased expenditures unless too great a dependence were placed on loans; and that in fairness the people should know before the end of 1918 what taxes they must pay for that year so as to practice the necessary economies. He recommended that war profits, incomes, and luxuries be made the chief subjects of increase taxation. "I cannot assure the country of a successful administration of the Treasury in 1918," he said, "if the question of further taxation is to be left undecided until 1919." On the day following this address Mr. Kitchin of North Carolina, chairman of the Committee on Ways and Means, made a very singular speech before the House. He accused the "publishers' lobby" of promoting the demand for immediate revenue legislation and of hoping in that way to get rid of the higher postal charges on newspapers and magazines under the new zone system. Mr. McAdoo had been influenced, he said.

> I do not think that Secretary McAdoo thought about the press, the newspapers and magazines, one way or the other. However, I do believe that away back, hidden somewhere, unseen by most of us, there was an influence of one of the shrewdest and most powerful lobbies that ever infested the corridors of the Capitol or the lobbies of the hotels here, which made itself felt with some in whose judgment the Secretary of the Treasury had great faith.

The Secretary made prompt denial of the implication contained in this passage.

On June 6, in a letter to Mr. Kitchin, Secretary McAdoo estimated the expenditures of the next fiscal year at $24,000,000,000, and suggested that a third of this be raised by taxation and the remainder by loans. He recommended that a war-profits tax at a high rate be superimposed upon the existing excess-profits tax, the tax payer being liable for whichever tax fell the more heavily upon him; that the normal tax upon unearned incomes should be increased; and that substantial taxes should be laid upon luxuries. The Committee on Ways and Means began its hearings next day. On July 9 the Treasury Department urged the adoption of luxury taxes, based on the English and French systems, which should fall partly upon the retailer, partly upon the manufacturer or producer, the so-called luxuries to include all articles of wear selling beyond a fixed price, jewelry, automobiles, whisky, etc.

It was not until Sept. 3, after three months spent in its preparation, that the bill was reported to the House. Of the total estimated expenditures for the fiscal year ($24,328,561,428), it proposed to raise $8,012,792,000 by taxation; and four taxes were to produce seven-eighths of this enormous sum—the tax upon excess profits, including war profits, $3,200,000,000; individual income tax, $1,480,000,000; corporation income tax, $984,000,000; tax on beverages, greatly increased, $1,137,000,000. Among the secondary imports, calculated to produce in the aggregate something like a billion dollars, the more important were: inheritance tax, $110,000,000; taxes upon passenger fares, freight, and express, $95,000,000; tax on theater admissions, $100,000,000; tax on gasoline, $40,000,000. The bill followed closely the general lines of the existing revenue laws, while greatly increasing rates in certain cases and correcting inequalities. In the main the committee sought to double revenue by doubling rates rather than to discover new sources of revenue. It did, however, amplify the small luxury list already existing and add a quasi-luxury list based upon a fixed sale price as Secretary McAdoo had proposed with respect to wearing apparel. The bill also included a Federal license for automobiles, the fee varying with the horse power. The normal tax levied upon individual incomes (in excess of the exemptions allowed in the bill) was raised to six per cent. on the first $4,000 and 12 per cent. for additional amounts; the surtaxes were likewise greatly increased, especially in the case of small or moderate incomes. The most striking feature of the bill was the war-profits tax superimposed, in accordance with the advice of the Secretary of the Treasury, upon the existing excess-profits tax (with the rates of the latter almost doubled). Under the war-profits plan a corporation would take the average of its net incomes for the pre-war years 1911-13, add an exemption of $3,000 to the average, subtract this sum from its net income of 1918, and pay an 80 per cent. tax on the remainder. Under the excess-profits plan a corporation, after deducting eight per cent. on its invested capital and a further sum of $3,000, would pay a tax of 35 per cent. on profits up to 15 per cent.; 50 per cent. on profits between 15 per cent. and 20 per cent.; and 70 per cent. on profits in excess of 20 per cent. The most frequently criticized feature of the bill was the tax on the net income of corporations, 12 per cent. should the income be distributed as dividends, 18 per cent. otherwise—a provision apt to discourage conservative management. On Sept. 20 the House unanimously passed the bill without modifying the committee draft in any important particular.

The Senate Finance Committee, having followed day by day the proceedings in the House Committee, might have been expected to report the bill without delay. After the lapse of two weeks, with remarkably little accomplished, Secretary McAdoo wrote to Chairman Simmons that unless the bill were quickly enacted into law, "financial disaster" might ensue. The Committee proceeded with its task of revision, however, without appearing to take the Secretary's letter much to heart. It cut in two the tax on automobiles; it made some changes in the luxury taxes; it lowered the rates on beverages with the expectation of producing larger sales and therefore larger revenues. But not until Oct. 22 was a decision reached on the most serious problem of the bill, the section on war profits and excess profits. That section was recast, the alternative system as fixed by the House being discarded in favor of a flat war-profits tax based upon pre-war earnings. A week later the excess-profits tax was extended to individuals and partnerships. The Committee still had the bill under consideration on Nov. 14 when, in view of the cessation of hostilities in Europe, Secretary McAdoo brought forward certain new proposals, again, however, urging the Committee to expedite the passage of the bill. He wrote to the chairman:

> These considerations lead me to believe that the Government's expenditures during the fiscal year ending June 30, 1919, may be in the neighborhood of $18,000,000,000.
>
> I am inclined to recommend a substantial reduction in the amount sought to be raised by the House bill. Changes have been made or are in contemplation by the Senate which, taken together with the anticipated elimination of revenue from liquor taxes, would reduce the amount to be raised by the pending revenue bill from the $8,000,000,000 or more provided for in the House bill, and originally suggested by me, to some $6,300,000,000. Further changes may, I think, with safety, be made in the bill with a view to reducing the amount of taxation to $6,000,000,000, which may be paid in installments during the calendar year 1919. The excess profits tax rates applicable to the calendar year 1918 should not be greater than those provided for in the existing law of October, 1917, and should be payable only in those cases where such excess profits tax would yield a larger return than the proposed war profits tax. The eighty per cent. war profits tax applicable to the calendar year 1918 should be retained. Contracts have been made during past months in the expectation of a heavy war profit tax. Everyone is agreed that war profits should be taxed. They must be taxed now.

When Congress adjourned on Nov. 21, the Committee was considering what specific reductions to make in the bill so as to conform with the recommendations of the Treasury. (See also *The Sixty-Fifth Congress, Third Session, infra*, and XIII, *Public Finance.*)

National Prohibition.—Through a great part of the session projects for limiting or prohibiting the liquor traffic were receiving consideration either in the Senate or in the House. That Congress would eventually be driven to favor national prohibition was suggested by the fact that two-thirds of the country had already gone "dry." But the drastic action which Congress did take, within the limits of a single session, came as something of a surprise, even to ardent reformers. The exigencies of war, especially the necessity of conserving foodstuffs, had a marked influence in shaping the course which Congress took. Prohibition advocates managed to connect their cause, to some extent, with the winning of the war. Four important measures were passed. (1) In December, 1917, a constitutional amendment establishing national prohibition was referred to the states for ratification (*A. Y. B.*, 1917, p. 18), with the proviso that ratification must take place within seven years and that the amendment should not be effective until one year after such ratification (see also XIV, *The Liquor Problem*). (2) An Act of May 23 prohibits the sale, manufacture, or importation of liquors in the territory of Hawaii. At any general election within two years after the conclusion of peace, however, there may be a referendum vote on the petition of 20 per cent. of the qualified voters; and if the majority of those voting do not reject the law, it shall continue in force. (3) A joint resolution of Sept. 12 authorized the President to establish zones of any size around coal mines, munition factories, shipbuilding plants, and other places where war materials are produced; within these zones intoxicating liquors may not be sold, manufactured, or distributed. This resolution, proposed by Senator Kellogg and passed in both houses without a dissentient vote, practically gave the President power to stop the liquor traffic, because it allowed him to determine the size of the zones. In form it was almost identical with a rider attached to the Food Stimulation bill; and it was brought forward as a separate resolution because of the delay in the enactment of that bill. (4) The Food Stimulation Act of Nov. 21 was designed to encourage agriculture and facilitate the distribution of agricultural products; to eradicate live stock diseases and plant diseases; to encourage the production of live stock; and to eliminate the waste of food (see also XVI, *Agriculture*). But to the original bill the advocates of prohibition attached two riders. In the first place the President was authorized to forbid the sale of intoxicants within zones which he might establish around plants producing war materials (see Kellogg resolution above). The other provision went much farther. It forbade the use of grains or fruit or other foodstuffs in the production of malt and vinous liquors after May 1, 1919, and until the end of demobilization; the sale of distilled spirits, beers, and wines after June 30, 1919; and the importation of liquors until the end of demobilization.

The Food Stimulation bill passed the house by a vote of 231 to 64. But before its passage, on May 23, Representative Randall proposed an amendment to the effect that half the appropriation sanctioned in the bill should not be available unless the President, by proclamation, prohibited the use of foodstuffs or fruits in the manufacture of beers and wines. The Randall amendment passed by a vote of 178 to 137. During the month of June hearings took place before the Senate Committee on Agriculture. The question of war-time prohibition evoked unduly divergent views from those whose opinion was asked. Bainbridge Colby, a member of the Shipping Board, said:

> It is the firm belief of the men to whom the nation has intrusted the great task of building our troop ships and our merchant marine that this legislation will produce widespread disaffection among the ranks of the shipworkers and will result in a very great diminution of our tonnage output. Of course the extent of this diminution must, until ascertained by experience, be a matter of opinion, but the most conservative opinion that has found expression in our councils upon the subject is that it will amount to at least 25 per cent. of the output of our shipyards.

Postmaster-General Burleson said that "this is no time for patience with fanatics"; Chairman Hurley of the Shipping Board, that "we cannot afford to experiment with the nation's destiny"; Samuel Gompers, President of the American Federation of Labor, that he protested against his shopmates being "treated as inanimate things without feeling or desire." Mr. Hoover, chief of the Food Administration, said that, in view of the large stocks of distilled spirits, to stop brewing would simply mean that the saloons would sell whisky and gin instead of beer. President Wilson, in a letter to Senator Sheppard, took the same ground:

> What is almost entirely overlooked is that there are, as I am informed, very large stocks of whisky in this country, and it seems to me quite certain that if the brewing of beer were prevented entirely, along with the other drinks, many of them harmless, which are derived from food or foodstuffs, the consumption of whisky would be stimulated and increased to a very considerable extent.
>
> My own judgment is that it is wise and statesmanlike to let the situation stand as it is for the present until, at any rate, I shall be apprised by the Food Administration that it is necessary in the way suggested still further to conserve the supply of food and foodstuffs. The Food Administration has not thought it necessary to go any further than we have in that matter already gone.

Nevertheless the Committee decided, on June 27, to report a prohibition amendment. This was a substitute for the Randall amendment proposed by Senator Norris of Nebraska. It provided that the manufacture of beer shall cease after the passage of the bill; the manufacture of wine after June 30, 1919; and the sale of whisky after the same date. Ten days afterwards Senator Gore, chairman of the Committee, presented a substitute for the Norris amendment. This provided that, until the conclusion of the war, no beer or wine should be manufactured after Nov. 1, 1918, and no whisky, beer, or wine sold after Dec. 31. Though more extreme than the proposals of Randall or Norris, it was sustained by the Senate on July 10, the vote being 36 to 33 (with 15 Republicans on each side). Towards the end of August the President intervened. Partly at least for the purpose of conserving the revenues derived from intoxicants, he persuaded Senator Sheppard of Texas, leader of the prohibitionist forces, to change the dates originally fixed. The Sheppard substitute for the Gore amendment, which the Senate passed without a roll call on Aug. 29, permitted the manufacture of beer and wine until May 1, 1919, and the sale of intoxicating liquors until July 1, 1919. With respect to the latter provision the President had in vain asked for an extension until Jan. 1, 1920. The Food Stimulation bill, thus amended, passed the Senate on Sept. 6 without a roll call. On Sept. 23 the House accepted the prohibition amendment as adopted in the Senate, but refused to concur in certain other changes which the Senate had made in the bill. It was not until Nov. 18 that the Senate gave way.

Woman Suffrage.—On Jan. 10 the House approved the submission to the state legislatures of a woman suffrage amendment in the following form:

> Resolved, By the Senate and House of Representatives of the United States of America in Congress assembled (two-thirds of each House concurring therein), that the following article be proposed to the Legislatures of the several States as an amendment to the Constitution of the United States, which, when ratified by three-fourths of the said Legislatures, shall be valid as part of said Constitution, namely:
>
> ARTICLE —
>
> Section 1. The right of citizens of the United States to vote shall not be denied or abridged by the United States, or by any State, on account of sex.
>
> Section 2. Congress shall have power, by appropriate legislation, to enforce the provisions of this article.

In the course of hearings before the Woman Suffrage Committee, which closed on Jan. 7, the arguments on each side were presented by the National American Suffrage Association and by the National Association Opposed to Woman Suffrage. Many others appeared before the Committee. Mr. Bailey of Texas, a former Senator, opposed the amendment because women were incapable of performing the three principal duties of citizenship: military service, sheriff service, and jury service. The amendment resolution was reported to the House on Jan. 8 by a vote of eight to three in the Committee. The proposal to fix a time limit for the adoption of the amendment by the states was rejected because of the severe criticism of the seven-year period allowed in the original resolution; there was a feeling that such a limitation might open the way to an attack upon the constitutionality of the amendment.

In the debate upon the resolution Miss Rankin of Montana was, by courtesy, permitted to make the first speech. Representative Clark of Florida criticized the President for shifting his ground and violating the terms of the Democratic platform. "President Wilson," he said, "on many occasions has declared that, while he favored woman suffrage, he considered it a matter for state action. He made that statement no longer ago than 1916 to an audience in Denver. Why has he changed his position?" These remarks referred to an announcement made on Jan. 9 after the Democratic members of the Woman Suffrage Committee had visited the President. According to this announcement the President regarded the extension of suffrage to women as "an act of right and justice to the women of the country and of the world." In Congress it was generally understood that the political aspects of the question had made it imperative for the President to speak. The attitude of the New York and Pennsylvania Republicans in the House indicated that Republican members would overwhelmingly support the amendment; the southern Democrats, having the negro question in view, regarded the amendment as anathema; and the Democratic party might well look with misgiving upon the effects of this situation in the 1918 campaign. Not much was accomplished by this manœuvre; Alabama, Georgia, Louisiana, Mississippi, and South Carolina cast every vote against equal suffrage; North Carolina and Virginia every vote but one; and if Arkansas threw her whole strength on the other side, nothing else could be expected from the representatives of a suffrage state.

The House, having defeated two proposed amendments (one offered by Mr. Moores of Indiana which would have required the resolution to be submitted to state conventions; another offered by Mr. Gard of Ohio which would have required adoption within seven years, as in the case of the prohibition amendment), passed the resolution by a vote of 274 to 136 —just the necessary two-thirds. The majority included 104 Democrats, 165 Republicans, two Independents, one Socialist, one Prohibitionist, and one Progressive; the minority, 102 Democrats, 33 Republicans, one Progressive. Seventeen did not vote. It is of interest to observe that 232 of the members were sitting in the House when in January, 1915, the suffrage amendment was rejected. Since then 36 had abandoned their opposition; not one had dropped out of the suffrage ranks. In the New York delegation of 43 only nine voted for equal suffrage in 1915; only three voted against it in 1918.

In the Senate there was long delay in acting upon the amendment, not because the Woman Suffrage Committee opposed it, but because a poll of the members of the Senate showed little prospect of carrying the measure through. As early as Feb. 11 the Democratic National Committee endorsed the amendment. Twice in June and again in July President Wilson expressed his hope that it would carry. He spoke of "the passage of the amendment at this time" as "an essential psychological element in the conduct of the war for democracy." When debate began in the Senate (Sept. 26), the hostility of the South manifested itself at once. John Sharp Williams of Mississippi wished to insert the word "white" before the word "citizens" so as to keep colored women from voting. Hardwick of Georgia said:

> With all due deference to the men of the North, I say you do not quite understand what it means when you vote to give the franchise to the negro. I predict that after this war the negro question in this country is going to be one of the most difficult ones.

It became evident that resistance would be stubborn and formidable.

At this juncture, with very short notice of his intention, President Wilson appeared before the Senate and urged the adoption of the amendment as a war measure. He said in part:

> This is a peoples' war, and the peoples' thinking constitutes its atmosphere and morale, not the predilections of the drawing room or the political considerations of the caucus. If we be indeed democrats, and wish to leave the world to democracy, we can ask other peoples to accept in proof of our sincerity and our ability to lead them whither they wish to be led nothing less persuasive and convincing than our actions.
>
> Our professions will not suffice. Verification must be forthcoming when verification is asked for. And in this case verification is asked for—asked for in this particular matter. You ask by whom? Not through diplomatic channels, not by foreign Ministers. Not by the intimations of Parliaments. It is asked for by the anxious, expectant, suffering peoples with whom we are dealing and who are willing to put their destinies in some measures in our hands, if they are sure that we wish the same things that they do.
>
> I do not speak my conjecture. It is not alone the voices of statesmen and of newspapers that reach me, and the voices of foolish and intemperate agitators do not reach me at all. Through many, many channels I have been made aware what the plain, struggling, workaday folk are thinking upon whom the chief terror and suffering of this tragic war falls. They are looking to the great, powerful, famous democracy of the West to lead them to the new day for which they have so long waited; and they think, in their logical simplicity, that democracy means that women shall play their part in affairs alongside men and upon an equal footing with them. If we reject measures like this in ignorant defiance of what a new age has brought forth, of what they have seen, but we have not, they will cease to believe in us; they will cease to follow or to trust us. . . .
>
> Have I said that the passage of this amendment is a vitally necessary war measure, and do you need further proof? Do you stand in need of the trust of other peoples and of the trust of our own women? Is that trust an asset, or is it not?
>
> I tell you plainly, as the Commander in Chief of our armies and of the gallant men in our fleets, as the present spokesman of this people in our dealings with the men and women throughout the world who are now our partners, as the responsible head of a great Government which stands and is questioned day by day as to its purposes, its principles, its hopes, whether they be serviceable to men everywhere or only to itself, and who must himself answer these questionings, or be shamed, as the guide and director of forces caught in the grip of war, and by the same token in need of every material and spiritual resource this great nation possesses—I tell you plainly that this measure which I urge upon you is vital to the winning of the war and to the energies alike of preparation and of battle.
>
> And not to the winning of the war only. It is vital to the right solution of the great problems which we must settle, and settle immediately when the war is over. We shall need them in our vision of affairs, as we have never needed them before, the sympathy and in-

sight and clear moral instinct of the women of the world.

Apparently the address had no effect in making proselytes. Next day the Senate rejected the amendment by a vote of 53 to 31 or three less than the required two-thirds. The original vote was 54 to 30; but Senator Jones of New Mexico (Dem.), when he saw that suffrage had lost, switched to the other side so that he might be able at a later time to move reconsideration. For suffrage voted: 26 Democrats, 27 Republicans; against it, 21 Democrats, 10 Republicans. Among the Democratic leaders who ignored the President's appeal were: Martin of Virginia (floor leader), Overman of North Carolina, Hitchcock of Nebraska, Williams of Mississippi, and Underwood of Alabama (see also V, *Popular Government*).

An act of June 13, 1918, empowers the territorial legislature of Hawaii to admit women to the vote.

The Webb Act.—The Webb Act, designed to encourage export trade by permitting combinations for that purpose, was twice passed by the House: first in the Sixty-fourth Congress and a second time in the Sixty-fifth Congress on June 13, 1917. President Wilson made it an Administration measure (*A. Y. B.*, 1917, p. 1). The Senate, however, was slow to respond to executive pressure because the bill entailed a modification of the Sherman Act, the effects of which could not clearly be foreseen. It was not until Dec. 12, 1917, that affirmative action was taken, the vote being 51 to 11. Afterwards certain differences had to be adjusted between the two houses in conference. The Act was approved on April 10.

It provides that the Sherman Act of 1890 shall not be construed as

> declaring illegal an association entered into for the sole purpose of engaging in the export trade and actually engaged in such export trade, or an agreement made or act done in the course of export trade by such association, provided such association, agreement, or act is not in restraint of the export trade of any competitor of such association

and provided there is no agreement artificially or intentionally to enhance or depress prices within the United States of commodities of the class exported by the association or otherwise to restrain trade therein. The powers of the Federal Trade Commission are extended so as to apply to unfair methods of competition in the export trade even when the acts complained of are done outside the territorial jurisdiction of the United States. Export associations must furnish to the commission details as to their organization and activities; failing to comply, they are liable to loss of their privileges under the Act and to a daily fine of $100, extending over the period of such failure. The commission receives large powers of investigation. Where it finds that the law has been violated, it may recommend readjustments in business practices and, if these recommendations are not complied with, refer the case to the Attorney-General.

Other Legislation.—In addition to the acts which have already been noticed Congress passed a number of highly important measures. (A list of all the enactments of general interest is given in Department IV.)

1. By acts of April 4 and July 9 it authorized the Third and Fourth Liberty Loans.
2. By an Act of March 8 it gave protection to the civil rights of soldiers and sailors engaged in the war (as in the matter of rent, mortgage, insurance, taxes).
3. By an act of March 1 it authorized the Emergency Fleet Corporation of the U. S. Shipping Board to acquire lands and buildings for the housing of shipyard employees and their families, $50,000,000 being appropriated for this purpose; and by an Act of May 16 it appropriated $60,000,000 for the purposes of providing housing, local transportation, and other general community utilities for such industrial workers as are engaged in arsenals and navy yards of the United States and in industries connected with and essential to the national defense.
4. By an Act of May 9 it amended the naturalization laws so as to protect unnaturalized Germans and Austrians serving with the American forces and also to permit the naturalization of enemy aliens who had taken out first papers before the United States entered the war.
5. By the Act of Oct. 16 it provided for the exclusion from the United States of aliens who advocate the forcible overthrow of the American Government, opposition to all organized government, the assassination of public officials, or the unlawful destruction of property.
6. By an Act of Oct. 5, intended to encourage the production and control

the distribution of certain minerals which formerly were largely imported, the President was authorized to acquire them by purchase or requisition, to store them and sell them at reasonable prices, and to fix duties which would prevent the importation of lower-priced minerals of the same kind.

7. By an Act of Jan. 18, necessitated by the difficulty of selling Farm Loan bonds in competition with Liberty bonds, the Secretary of the Treasury was authorized to purchase Farm Loan bonds to the amount of $100,000,000 in each of the fiscal years 1918 and 1919 (see also XIII, *Banking and Currency*).

8. By an Act of June 10 Congress provided that anyone who served 90 days in the United States forces during the Civil War should receive a minimum pension of $30 a month and that the pension should increase with the length of service to a maximum of $40.

9. By an Act of Oct. 16, applying to any election (primary included) at which a Senator or Representative or delegate to Congress is chosen, a fine of not more than $1,000 or imprisonment for not more than one year or both is imposed on anyone who gives or promises anything of value for the purpose of persuading a person to vote or withhold his vote, or to vote for or against a particular candidate.

10. By an Act of March 21 (known commonly as the Daylight Saving Act) Congress provided that each year between the last Sunday in March at 2 a. m. and the last Sunday in October at 2 a. m. standard time should be advanced one hour.

THE SIXTY-FIFTH CONGRESS, THIRD SESSION

The President's Message. — The third and last session of the Sixty-fifth Congress opened on Dec. 2. President Wilson delivered his annual message before a joint session of the two houses on the eve of his departure for Europe to participate in the Peace Conference. He formally declared his purpose

> to join in Paris the representatives of the Governments with which we have been associated in the war . . . for the purpose of discussing with them the main features of the treaty of peace. I realize the great inconveniences that will attend my leaving the country, particularly at this time, but the conclusion that it was my paramount duty to go has been forced upon me by considerations which I hope will seem as conclusive to you as they have seemed to me.

Aside from the references to his overseas mission the passage which attracted most attention dealt with the situation of the railroads. Admitting that he had no answer ready as to the best future course to take "in the interest of the public and in fairness to their owners," the President said that it would presently become his duty to surrender the roads "even before the expiration of the statutory period, unless there should appear some clear prospect in the meantime of a legislative solution." He described the alternative courses which might be taken:

> We can simply release the roads and go back to the old conditions of private management and unrestricted competition and multiform regulation by both state and Federal authorities, or we can go to the opposite extreme and establish complete control, accompanied, if necessary, by actual Government ownership; or we can adopt an intermediate course of modified private control under a more unified and affirmative public regulation and under such alterations of the law as will permit wasteful competition to be avoided, and a considerable degree of unification of administration to be effected, as, for example, by regional corporations under which the railways of definable areas would be in effect combined in single systems.

The President also urged the passage of the woman-suffrage amendment in recognition of the services performed by the women in the war. He expressed his hope that the treaty of "friendship and adjustment" with Colombia would be ratified by the Senate. Various other matters were touched upon, such as economic and industrial adjustments after the war and employment for returned soldiers.

The War Revenue Bill.—On Dec. 6 the War Revenue bill, as redrafted by the Finance Committee, was presented to the Senate. It provided for the raising of about $6,000,000,000 in 1919 and $4,000,000,000 in 1920, the revenue for the first year being estimated as follows: incomes, $2,207,000,000; excess profits, $2,400,000,000; estates or inheritances, $75,000,000; transportation and insurance, $229,000,000; beverages, $450,000,000; tobacco, $240,600,000; admissions and dues, $54,000,000; excise taxes, $123,000,000; special taxes, $73,866,000; stamp taxes, $31,000,000; floor taxes, $70,000,000.

The bill passed the Senate on Dec.

23 by a *viva voce* vote. The vote came after Senator La Follette, in a three-hour speech, urged the adoption of a substitute measure providing a higher schedule of excess profits taxes. He wished to raise $9,000,000,000 through the bill, of which $5,000,000,000 would be derived from corporation war profits. The substitute was rejected by a vote of 55 to six.

Three important changes were made in the bill as it came from the Senate Finance Committee. (1) The semi-luxury taxes approved by the House were restored by a vote of 38 to 32; but the rate was reduced from 20 per cent. to 10 per cent. (2) An assessment was laid upon all campaign contributions exceeding $500. (3) By the Sheppard amendment the District of Columbia was made bone-dry. This amendment prohibits the importation of any liquor into the District. The Senate approved a committee amendment repealing the zone rates on second-class mail and substituting a rate of one cent a pound within 150 miles and 1½ cents beyond.

Estimates for 1920.—The estimates for the fiscal year 1920, as submitted to Congress on Dec. 2, called for total appropriations of $7,443,415,838, of which $5,212,000,000 was for the War and Navy Departments, $893,000,000 to pay interest on war debts, and $579,000,000 for continuing the construction programme for the merchant marine.

THE ADMINISTRATION

Resignation of Secretary McAdoo.—The resignation of William Gibbs McAdoo, Secretary of the Treasury and Director-General of Railroads, was announced on Nov. 22. In a letter to President Wilson he assigned as the sole reason for retirement the necessity of returning to private business in order to recoup his financial resources, which had been depleted during the five years and eight months of public service. On Dec. 5 the President nominated Carter Glass of Virginia as Secretary of the Treasury. Mr. Glass, who was chairman of the House Committee on Banking and Currency, had recently been elected to Congress for his tenth term. A week later Walker D. Hines, one of the most prominent transportation authorities in the country, became Director-General of Railroads. (See also IV, *The National Administration.*)

Telegraphs and Telephones under Government Control.—While the resolution providing for the taking over of electrical communications by the Government was before Congress (see *supra*) the threatened strike of Western Union employees was postponed by the interposition of the Department of Labor, but the situation still remained very serious. The resolution of July 16, empowering the President to take over all telephone, telegraph, cable, and radio means of communication in the United States, provided that "just compensation shall be made" for such control,

> to be determined by the President; and if the amount thereof . . . is unsatisfactory to the person entitled to receive the same, such person shall be paid 75 per cent. of the amount so determined by the President and shall be entitled to sue the United States to recover such further sum as added to the 75 per cent. will make up such amount as will be just compensation therefor.

On July 22 President Wilson issued a proclamation placing all telegraph and telephone lines under Federal control. The Postmaster-General was placed in charge of the wire systems, and the proclamation provided that, unless otherwise ordered, the existing management and subordinate staff should not be disturbed.

The radio service was already in the control of the Navy. It was understood that certain problems resulting from the foreign ownership of cable lines had kept the Government from taking possession of them. On Nov. 2, however, by a proclamation which was not made public for two weeks, the President placed all marine cables under the management of the Postmaster-General. This proclamation affected 13 transatlantic cables, one Pacific cable, one South American cable, and one Cuban cable—16 in all, with an approximate length of 75,000 nautical miles. Of the Atlantic cables concerned eight were operated by the Western Union (six of them being leased from British companies) and five by the Postal Telegraph Commercial Cable Co.

There was much controversy over the propriety of this Government action. The resolution of July 16 authorized the President to act "during the continuance of the present war" and "whenever he deems it necessary for the national security and defense." These questions were asked: Was the step taken in view of national security? Was it in reality a war measure now that the armistice had been signed?

Clarence H. Mackay, President of the Postal Telegraph Commercial Cable Co., said on Nov. 16:

> I cannot understand why the Government takes over the cables as a war measure notwithstanding the war being now practically ended. The cable companies have rendered splendid service ever since the outbreak of the European War four years ago. Why at this late date the Post Office Department takes over the cables as a war necessity, in the face of the fact that the Navy Department has censored all cable messages since April, 1917, and is still censoring them, is beyond my comprehension.

On Nov. 11 the Postmaster-General issued a statement to justify the action of the Government. He said:

> There never was a time in the history of this war . . . which called for such a close control of the cable system as today and will continue during this period of readjustment. . . . The recent breakdown in connection with one of the cable systems has demonstrated the absolute necessity of being able to utilize at will all the facilities of either cable systems with all of the land line systems in order that traffic may be adjusted in the same hands as it is on the land lines.

Conspiracy and Sedition. — During the course of the year enemy aliens were convicted for various offenses, and conspiracies were detected by the Department of Justice. On Feb. 5 Franz Rintelen, a German spy, and 10 other Germans were convicted by jury in the Federal court at New York of conspiracy to destroy the British freighter *Kirk Oswald* by the use of bombs. Each of the offenders was sentenced to 18 months' imprisonment and a fine of $2,000. Most of the sentenced men had already been convicted of complicity in other plots.

At San Francisco on April 30 maximum sentences of two years' imprisonment and fines of $10,000 were imposed upon Frank Bopp, former German consul-general, and E. H. von Schack, former vice-consul, these persons having been convicted of fomenting a revolution in British India (see also III, *The British Empire*). Twenty-seven other defendants, including 14 Hindus, were sentenced to shorter terms.

At New York on June 7 indictments were returned, charging conspiracy to commit treason and espionage against seven persons, including Commander Hermann Woesels of the German Navy and Baroness Maria von Kretschmann, both of whom were named as spies.

Dr. Edward A. Rumley, publisher of the New York *Evening Mail*, was arrested on July 8, on the charge of perjury. It appeared that the German Government had invested over $1,000,000 in the paper, for propaganda purposes before the United States entered the war. Dr. Rumley, according to the charges, made false statements as to the ownership of the paper. On July 28 the deputy state attorney-general issued a statement which showed that Rumley had directed the expenditure of $205,000 in the early part of 1915 in an advertising campaign in the foreign-language press against the American manufacture of munitions and that this sum had been traced to a bank account of Ambassador von Bernstorff and Dr. Heinrich Albert. On Aug. 2, Rumley was indicted on two counts, (1) perjury in regard to the true ownership of the paper, and (2) failure to file a report of German ownership with the Alien Property Custodian.

On January 14 the Supreme Court affirmed the decision of the lower court in the case of Emma Goldman and Alexander Berkman, who were charged with inciting opposition to the draft law in New York. These persons, sentenced to imprisonment of two years and $10,000 fine each, had attacked the constitutionality of the draft law before the Supreme Court.

After a four months' trial before the Federal court at Chicago, William D. Haywood and fourteen of his coadjutors in the I. W. W. were sentenced on Aug. 30 to serve 20 years in prison and pay fines of $20,000 each for impeding the prosecution of the war and violating the Espionage Act. Milder penalties were imposed on 80 others convicted at the same time. (See also XV, *Labor*.)

On March 9 Victor Berger, former Socialist Congressman, Adolph Germer, National Secretary of the Socialist Party, and three other Socialists were indicted at Chicago on the charge of obstructing recruiting and impeding the prosecution of the war. On Jan. 8, 1919, after Berger's election to Congress, the five defendants were found guilty. Sentence was withheld, however, pending application for a new trial. (See also XIV, *Socialism*.)

Scott Nearing, formerly professor at the University of Pennsylvania, was indicted at New York on March 21 under the Espionage Act. He was charged with distributing through the mails a series of articles under the title "The Great Madness," in which he denounced the Liberty Loan and the selective-service law. He defended Senator La Follette and other Senators who were referred to by President Wilson as "willful," and made other utterances which the Government alleged had the tendency to create mutiny, disloyalty, and insubordination among the armed forces of the United States.

On March 17, speaking before a woman's club at Kansas City, Mo., Rose Pastor Stokes of New York, a Socialist, denounced the war and America's entrance into it as the outcome of capitalistic influences. She was arrested on March 24. On May 23 she was convicted of violating the Espionage Act, the charges against her involving willful attempt to cause insubordination, disloyalty and mutiny in the military and naval forces, obstructing recruiting, and making false reports and false statements with intent to promote the success of the enemy. On June 1 she was sentenced to ten years' imprisonment without any fine.

Eugene V. Debs, four times Socialist candidate for the Presidency, was arrested at Cleveland, on June 30, on the charge of violating the Espionage Act. The charge was based mainly on a speech delivered two weeks earlier at a Socialist convention. The purpose of the Allies, he said, among other things, did not differ from that of the Central Powers —plunder. On Sept. 14 Debs was sentenced to ten years' imprisonment.

On Jan. 11, 1919, the indictment against a New York publication called the *Masses* was dismissed. The publishers of the magazine had been charged with violation of the Espionage Act, but the jury in the first trial disagreed ten for conviction to two, and in the second trial eight to four.

POLITICS AND PARTIES

JAMES ALBERT WOODBURN

Non-Partisan Support of the War.—During the year 1918 the interest of the American people continued to be absorbed in the Great War, in which their nation had become an important factor. But for the fact that this year was fixed by the Constitution and system of government for a biennial election of a new Congress, the people's lack of activity in national politics, to which the last YEAR BOOK (p. 30) called attention, would have continued throughout the year 1918. In spite of the fact that it was an election year, the people gave but little of their attention to party claims and activities. More than ever before in the prosecution of a war national unity was secured in America. Narrow partisanship in relation to the war was generally eliminated throughout the country. Party electioneering was neglected, and party strife and discussion were restrained and subdued to within a fortnight of the November election. A determination to win the war, a willingness to serve and sacrifice to that end, an earnest desire to present a united front against the common foe—such were the manifestations of the national spirit.

This non-partisan patriotic purpose was reflected in the expressions of recognized party leaders. Mr. Mann, the floor leader of the Republicans in the House of Representatives, asserted that never before had partisanship been so obliterated and that he had never known more harmony and smoothness in legislation. Majority and minority members in committees had worked together in unity, without friction and without recognition of party lines. Mr. Gillett of Massachusetts, a prominent Republican leader in the House (acting as floor leader during Mr. Mann's illness), asserted that the Republican Party in the future, as in the past, intended to prove that the one purpose in which it was engaged, heart and soul, was to give to the Democratic Administration everything possible to make it more successful in the war; not to criticize or complain, but "ignoring all sectional or partisan feelings, to vie with the men from the North and South and West who differ with us in political faith in supporting the Executive until this terrible scourge of war is over."

Like expressions from Republican leaders came from outside of Congress. As President of the League to Enforce Peace, Ex-President Taft warmly supported the Administration, and he officially coöperated with it by speaking in many parts of the country in support of the war. Ex-President Roosevelt criticised the Administration for tardiness and inefficiency, but he called for popular support in all measures that were calculated to "speed up the war." Elihu Root, in a speech in New York City in May before the National Security League, said that he would pay absolutely no attention to the party affiliation of a candidate for Congress, but only to the question whether the candidate was "a loyal win-the-war American." This sentiment received overwhelming applause and it was no doubt the sentiment of patriotic Republicans throughout the country.

President Wilson Speaks for the Adjournment of Politics.—President Wilson spoke to the same effect on behalf of the Democrats. In a notable address before Congress during the last week in May, speaking for all the people and appealing to Congress and the country for taxation in support of the war (see *The Sixty-Fifth Congress, Second Session, supra*), the President expressed this non-partisan patriotic spirit. "The first duty of the nation," said the President, "is to win the war, and we dare not go to the elections until we have done our duty to the full." He then gave expression to what became one of the most notable and most frequently quoted political utterances of the year:

> Politics is adjourned. The elections will go to those who think least of it; to those who go to the constituencies without explanation or excuses, with a plain record of duty faithfully and disinterestedly performed. . . . The people of this country are not only united in the resolute purpose to win the war, but ready and willing to bear any burden and undergo any sacrifice that it may be necessary for them to bear in order to win it.

In this official address, as in his Red Cross speech in New York the previous week, the President notified the country and the world that his one fixed purpose was to lead his countrymen to victory and that his chief wish in this common cause was to have his country powerful and united.

The Republican National Committee. — Notwithstanding this general spirit of national unity and harmony in support of the war, there were political events and party activities, and some suspicions and party charges and countercharges, that demand a place in the year's record. The party organizations were revived and maintained, and the party managers deemed it necessary to keep their working forces in line and their machinery in order. The directing committees were alert to take advantage of any opportunity to promote the strength and support of their respective parties. Vance C. McCormick continued as chairman of the Democratic National Committee. Early in the year (at St. Louis, Feb. 13) Will H. Hays of Indiana was elected chairman of the Republican National Committee.

Ordinarily the election of a national chairman seldom attracts the attention of the great body of voters, although it is always a matter of interest to the inside party managers. In the election of Mr. Hays there was a contest of public interest and importance. His opponent was John T. Adams of Iowa, who was a member of the National Committee, as Mr. Hays was not. Mr. Adams had enough votes in the Committee pledged to elect him, but it was revealed that at the beginning of the European War he had been strongly pro-German in his sympathies and that he had not been warm in the support of the war even after America's entrance into the conflict. On the other hand, Mr. Hays had seen clearly from the first the vital issues of the war and from the time of America's entrance he had been, as chairman of the Indiana State Council of Defense, a devoted, ardent and untiring worker in the cause of the war. Another factor also entered into the contest. Mr. Adams had been an orthodox Republican of the "Old Guard" or of the "standpat" variety. Mr. Hays had not broken with his party in 1912 to follow Mr. Roosevelt, but he was known to have progressive sympathies and tendencies, and it was also known that he stood for fair play and a square deal within the party and he held that the party management should be under the control of the rank and file of the party and not managed by cliques and bosses. Under his leadership on these principles in 1916 the Indiana Republicans were reunited and they carried their state by a substantial majority for Mr. Hughes and elected nine out of the 13 Congressmen, reversing the party complexion of the delegation. Mr. Hays' election as national chairman was an assurance that the management of the Republican campaign would be vigorously conducted and on a high level, in harmony with good ideals and honorable methods, with a desire to reunite the party and reconcile former Progressives to its support.

Mr. Hays opened headquarters in New York City and devoted his energies to organizing and harmonizing his party forces. In published articles and interviews (*New York Times*, June 30, *Forum* for August) and before Republican state conventions (as in Nebraska, July 30) he interpreted the Republican position and programme. This he placed under three heads: (1) win the war now; (2) peace only with victory; (3) instant preparation for the solution of problems that are sure to follow the war. He charged the Democratic Administration with "playing politics" with the war, which he proclaimed to be a people's war and not the war of any political party. He pledged every action of the Republican Party in every possible connection, in every district of the nation to the winning of the war, and he appealed to every patriot whatever his politics to aid in keeping partisan politics out of the war management. "We call upon all men and women," said Mr. Hays, "to support the Government without thought of party. . . . The Republican Party has always been a war party and its success will aid the progress of the war, for we demand an even more vigorous prosecution of it than do the Democrats."

Mr. Hays was obviously seeking to forestall and prevent the Democrats from capitalizing the patriotic war spirit of the country for partisan ends. He explained (since he was bending all his energies toward electing Republicans to Congress) that while there should be "no politics in the war," he did not mean there should be "no politics during the war." Parties and party contests are necessary and advisable, he said, in order that government may function healthily. The line of cleavage between the parties is still the historic one—"the Republican Party is for a protective tariff and is against too great federalization of industries and activities, except as necessary war measures." Mr. Hays also reemphasized the importance of combating the growth of socialistic thought and of drawing the country to a sane constitutional limitation away from demoralizing federalization after the war.

The Politics of the President.—In Congress early in the year there was much criticism of the Administration for alleged lack of vigor in the prosecution of the war. Much of it came from Democrats, but the President and his friends felt that the criticisms were inspired largely by partisan and unfair hostility to the Administration, and they resented the criticisms and resisted the several proposals for the reorganization of the Executive as designed to take the management of the war out of the President's hands where the Constitution had lodged it. The President's opposition, culminating in the passage of the Overman Act, put an end effectually to these proposals. (See also *The Sixty-Fifth Congress, Second Session, supra.*)

Late in 1917 President Wilson paid a tribute to Senator Knute Nelson of Minnesota for his war service, and the President suggested to the Minnesota Democrats that this Republican Senator should be reëlected. The Republican critics of the President charged that this was a shrewd game of politics, which was designed to stimulate a non-partisan campaign by offering no opposing candidates only in hopelessly Republican states and districts, in case the loyalty of the Republican sitting member seeking reëlection was unquestioned. In such a case the President's party in Congress would lose no support. In other districts where there was a chance of electing a Democrat, party lines were to be drawn and an active party effort was to be made. The Republicans felt that if this Democratic "non-partisan plan" were not opposed, the result would be an increase in the Democratic majority in the House.

In view of this policy Ex-President Taft advised the Republicans that they too should consider not merely party power and success, since in the midst of the war the people were not much concerned with parties, but to try to show the people that the nation would more certainly attain a decisive victory over the Germans with a Republican Congress than with a Democratic Congress. "It is no time to attack the President," said Mr. Taft, "for defects in military preparation before the war. That water has run over the wheel and the people may properly regard such an attack as irrelevant in this election." The people would elect a Republican Congress "only if they are made to see that with a Republican Congress back of him he will more certainly perform the people's will to adopt and carry to the bitter end at any cost a world plan to conquer Germany." Mr. Taft thought the President ought not to use his official influence or to enter into party contests in cases where the candidates of both parties were of undoubted loyalty and that he had unwisely done so in a by-election in Wisconsin.

The Wisconsin Senatorial Election.—On account of the accidental death of Senator Husting of Wisconsin, a special Senatorial election was held in that state. Three candidates announced themselves before the Republican primaries, Ex-Governor Francis E. McGovern, Representative Irvine L. Lenroot, and James Thompson, an anti-war follower of Senator La Follette (who was under charges in the Senate for disloyal utterances). Governor McGovern withdrew his candidacy in order that the loyalist vote within his party might not be divided, and he urged his friends to support Mr. Lenroot, so that his party might not be "disgraced and discredited for years to come as now seems inevitable unless the choice of the Republicans is narrowed down to one candidate on each side of the great, vital, and transcendant issue of loyal and patriotic Americanism." Mr. Lenroot was nominated by the Republicans and elected by a plurality of about 10,000 votes over the Democratic candidate, Joseph E. Davies, who had been supported in the campaign by a public letter from President Wilson—an act which was not well relished by Republicans since there was no question about Mr. Lenroot's loyal support of the war.

Mr. Lenroot had voted for the McLemore resolution warning Americans not to travel on belligerent vessels carrying munitions, and thus he had voted to acquiesce in the piratical policy of the German submarine. This, together with the embargo on munitions and the armed neutrality measure, the President in his Davies letter called the "acid test in our country to disclose true loyalty and genuine Americanism." But since America's entrance into the war there had been no doubt of Mr. Lenroot's loyal support of his country's cause. Victor Berger, Socialist, an open advocate of immediate peace with Germany, came third in the Wisconsin Senatorial election, receiving a rather startling number of votes, about 97,000. The combined votes for the two loyal advocates of a vigorous prosecution of the war, however, exceeded Berger's vote by nearly 200,000. In the November election Berger was elected to the lower house of Congress on the Socialist ticket from a Milwaukee district.

In view of the Democratic claims for support on the loyalty issue which their leaders occasionally put forth, the Republicans sought to show that their party was even more loyal in support of the war. They contended with much force that on numerous occasions they had stood behind the President in supporting the war more faithfully and effectively than the Democrats, and in this connection they cited particularly the Selective Service Act of 1917 (*A. Y. B.*, 1917, p. 11).

The Primary Campaign in New York.—It appeared that William Randolph Hearst was laying his plans to become the Democratic candidate for governor of New York. Hearst in his newspapers had been a severe, not to say unscrupulous, critic of the Wilson Administration; he had been supporting Germany as against Great Britain in the war before America's entrance, and his denunciation of war legislation and war measures after America had been forced into the conflict brought him under suspicion of pro-Germanism and disloyalty. His successful candidacy would have been interpreted as a popular disapproval of the war. When the New York Democratic State Convention met, Judge Seabury, who was leading a movement to prevent the nomination of Hearst for Governor, offered a resolution expressing renewed confidence in the Administration and whole-hearted support in the conduct of the war, and

> as an earnest of their loyalty the Democrats of New York repudiate every truckler with our country's enemies who strives or has striven to extenuate or excuse such crimes against humanity as the rape of Belgium, the sinking of the *Lusitania*, and the German policy of assassination by submarines; who seeks or has sought to sow dissension among our allies or who now seeks to capitalize by election to public office the latent treason whose total annihilation is the most pressing need of the hour.

No names were mentioned in this resolution, but every delegate understood its thinly veiled meaning, and under suspension of the rules the Seabury resolution was adopted with a shout and without dissent. The Hearst candidacy was effectually placed in a state of subsidence.

The Democratic Convention demanded a governor for New York who would devote "his every thought, energy, and ambition in support of the President." The party declared for a referendum on the proposed Federal prohibition amendment; reduction in the state budget; increased efficiency in agricultural production; the prevention of profiteering; increased financial support for the public schools; Americanization of immigrants and citizens; public development of water power; municipal ownership of public utilities; extension of the workmen's compensation law; protection of women in industries; a minimum wage commission; strict enforcement of civil-service laws; revision of the tax laws, "so readjusting the burdens of taxation as to apportion them in accordance to the benefits of government." On this platform Alfred E. Smith, a Tammany leader of good character, good record, and good reputation with the people, was nominated for governor.

An effort was made to induce Mr. Roosevelt to run for governor of New York in the Republican primaries but the Colonel refused the urgent invitation, which came largely from a faction in the party which wished to use him to defeat the renomination of Governor Whitman. In a speech at Saratoga before the Republican State Convention Colonel Roosevelt urged the speeding up of the war; the Americanization of the alien; one language in America, "the language of the Declaration of Independence, of Washington's farewell, and of Lincoln's Gettysburg address"; a unified, unqualified, and undivided American loyalty to the country; the raising of 6,000,000 men for the Army by the extension of the draft without further delays, and "no peace until Germany is beaten to her knees"; the election of a Republican Congress "to support the Adminstration at every point where it acts vigorously in prosecuting the war and to supply its deficiencies in its prosecution," or fearlessly to supervise and investigate when necessary; universal obligatory military training for a period of six months for all fit young men between 19 and 21, and during a longer time if industrial training can be added; avoidance of Government ownership of industries if possible, with a purpose to "steer between the anarchy of unregulated individualism and the deadening formalism and inefficiency of widespread state ownership, and to encourage and stimulate private action and coöperation subject to government control." Mr. Roosevelt advocated also a protective tariff, the stoppage of privateering and the right of labor to organize to protect its interest and to secure collective bargaining, labor to be regarded as a partner in the enterprises in which it is engaged. Governor Whitman was renominated in the primaries for a third term by the Republicans despite considerable opposition directed by the former "standpat" element of the party and by the liquor forces, on account of Governor Whitman's stand in favor of the ratification by New York of the Federal prohibition amendment.

Candidates and the War.—In nominations to Congress, loyalty in support of the war was the direct issue in many cases. The National Security League sent a questionnaire to candidates to ascertain the soundness of each as to his support of the war, and the League also sent information to voters concerning members of Congress coming up for reëlection, as to whether they had voted "right" or "wrong" on war measures that had come up both prior to and after America's entrance into the war. The President also publicly sought the defeat for renomination of Senators and Representatives within his party if they had opposed the Administration's war policies, and generally the President's influence carried sufficient weight to turn the scale. This occurred in the case of Representatives Slayden of Texas and Huddelson of Alabama and of Senators Vardaman of Mississippi and Hardwick of Georgia, all of whom were defeated for renomination. President Wilson asked and secured the defeat of Ex-Governor Blease of South Carolina for Senator, and the voters of Cleveland, Ohio, defeated Representatives Crosser and Gordon on the same grounds. These candidates were defeated because they were regarded as unfaithful in support of the war according to President Wilson's standard. The Republicans did not resent this action on the part of the President but they contended that it should be applied not for partisan purposes but only and solely as against any candidate of either party who had failed in giving loyal support to the war. Of the Senators and Representatives who criticized or hampered the country in its war making, Senator George W. Norris of Nebraska was the only one who survived the test of the primaries. In Missouri Joseph W. Folk, a loyal supporter of the war, defeated Mr. Wilfley in the primaries. Miss Jeannette M. Rankin of Montana, who had voted against the war, was defeated for renomination. In Minnesota Governor Burnquist, a stout loyalist, defeated in the Republican primaries Charles A. Lindenbergh, a pacifist leader of the Non-Partisan League, while Senator Nelson of that state, an ardent supporter of the war, was renominated without opposition and was unopposed by the Democrats in the election, as the President had advised, until the closing weeks of the campaign, when through the efforts of the agencies of the Non-Partisan League and of some Democrats an opposing candidate was put up. In Wisconsin Governor Phillip was brought to the verge of defeat because he had opposed war measures and had tried to curry favor with the German element of his state.

Party Combination against the Socialists.—In four Congressional districts in New York City the committees of the Democratic and Republican parties arranged to combine the votes of their respective parties against anti-war Socialist candidates who had shown popular strength and whose election seemed probable if there were two loyalist candidates in the field. The object of the combination was to support the war and to that end to defeat Meyer London and Morris Hilquit, Socialists and anti-war candidates. This line of action was first suggested by the National Security League; President Wilson in letters and public utterances gave impetus to the suggestion, while Elihu Root urged the wisdom of the plan upon the Republicans. It was successful, and both Socialist candidates were defeated.

The Senatorial Candidacy of Henry Ford.—One of the most interesting of the Senatorial candidacies in the country was that of Henry Ford in Michigan. Mr. Ford consented to become a candidate for Senator at the solicitation of President Wilson. In June the Democratic State Committee at Lansing passed a resolution urging the Republicans of Michigan to nominate Mr. Ford for Senator and stating that the Democrats would endorse the selection and thus make the election non-partisan. This was done without consultation with Mr. Ford, but soon afterwards President Wilson sent for Mr. Ford to come to the White House and requested him to accept a nomination. "I took his words," said Mr. Ford, "as practically a command from the leader of our whole country in this time of war and consented to serve if elected." Ford's name went before both the Democratic and Republican primaries in Michigan early in August. He received the nomination in the Democratic primary, and received nearly 72,000 votes in the Republican primary against nearly 115,000 for Truman H. Newberry, while Ex-Governor Osborne received about 47,000 votes. Mr. Newberry and his managers admitted having spent $176,000 in the primary canvass. Mr. Ford took no part in the contest in his own interest; he refused to spend any money to promote his candidacy and he refused to be bound by any party pledges. To his opponents' expenditure Mr. Ford and his friends attributed his own defeat in the Republican primaries. Just prior to the November election Mr. Ford gave those who proposed to vote for him explicitly to understand that he was not a party man and that he was bound by no pledge, "except to support President Wilson's war measures while he continues his present and past wise course in the conduct of the war." Despite his non-partisan position and this obvious lack of "practical politics," the Democratic State Convention pledged support to Mr. Ford's candidacy, and it denounced the campaign expenditures of the Republican candidate as being "in gross violation of the spirit and letter of the law."

The Non-Partisan League.—In the field of politics and economic legislation, the Non-Partisan League (formed in North Dakota in the spring of 1915) attracted even more attention than in 1917 (*A. Y. B.*, 1917, p. 32). The League was originally organized for the purpose of reforming the marketing system of farm products which was held in the agricultural states to work great injustice to the farmers. In consequence the League became national in its scope, and it was organized as the National Non-Partisan League in 15 states, Minnesota, North Dakota, South Dakota, Wisconsin, Montana, Idaho, Washington, Colorado, Nebraska, Iowa, Kansas, Oklahoma, Texas, and some agitation and organization were carried to New York State and elsewhere in the East. The League was honestly favored by those who looked upon it as a beneficent popular movement and as honestly opposed by those who looked upon it as dangerous and reckless in its socialistic programme. In attempts to break down its influence in its campaign for votes, it was charged with pacifism, disloyalty, and pro-Germanism, but its own advocates, journals and literature do not afford justification for such imputations (see the *Non-Partisan Leader*, St. Paul, Minn., and the *North Dakota Leader*, Fargo, N. D.). The basic idea of the League is public ownership of public necessities. Its contention is that the State should build, own, and control the facilities for carrying products of the farm to the city at the cost of carrying. The League officers claimed that the members of the League were backing the President, and they asserted that the big business interests and politicians and profiteers were traducing the League. It was shown that in North Dakota the League had brought about a grain-grading commission; the standardizing of rural schools, with better teachers and better attendance; an inheritance tax on large fortunes; votes for women; increased support for the Agricultural College, where it was shown that low-grade 70-cent wheat was worth as much for flour as the higher grades ($1.70 per bushel); new classifications for taxation to relieve farm improvements; a dairy commission; a license system for creameries; a guarantee of bank deposits; and a general welfare commission. These measures show the general social tendency of the League's work. A state convention of the League held in Minnesota (March 19) adopted a platform pledging its members to the support of the country in the crisis of the war "to free the world from autocracy and to establish democracy among the peoples of the earth." The convention denounced German military autocracy as revealed in the ruthless rape of Russia as a menace to the world. It endorsed the war aims of President Wilson as "a sure basis for a lasting and a democratic peace." While the people were struggling for democracy in the world at large, however, the convention would have them to be

> not unmindful of the enemies of democracy in the homeland, the powers of special privilege which take advantage of the opportunity which war affords to intrench themselves more firmly in the control of government and industry. These interests are amassing enormous fortunes out of the world's misery. They are reaching out for the control of public resources; they are striving to destroy the organizations of farmers and laborers; they are handicapping the progress of the war by profiteering, thus prolonging the war and sacrificing lives of men.

Governor Burnquist of Minnesota, candidate for reëlection, who had denounced the League as "a party of discontent" and as "pro-Germans," was accused of arraying class against class and of raising the issue of loyalty against the organized farmers and workers.

The Minnesota League set forth a typical platform containing the following demands:

1. Exemption of farm improvements from taxation.
2. Tonnage tax on ore production.
3. Rural-credit banks at cost.
4. State terminal elevators, warehouses, flour mills, stockyards, packing houses, creameries, and cold-storage plants.
5. State hail insurance.
6. More equitable system of state inspection and grading of grain.
7. Equal taxation of property of railroads, mines, telegraph, telephone, electric light and power companies, and all public-utility corporations, as compared with that of other property owners.
8. State-owned and operated pulp and paper mills to furnish print paper at cost.
9. A soldiers' moratorium law to protect our soldiers at the front from suffering financial loss while in the service of their country, to continue six months after the war.

The convention pledged united support to the war, and in the interest of organized town and city labor it declared for state insurance; state free employment bureaus; state old-age pensions; and a state eight-hour law, except in agricultural pursuits.

As to the conduct of the war and for the promotion of national interests, the Non-Partisan League favored:

1. Legislation to enable President Wilson to carry out his price-fixing programme, to prevent extortionate profits.
2. Legislation to enable the Government to buy and distribute necessaries at cost through the parcel post.
3. Increasing the tax on large incomes and excess profits, to continue until all the costs of the war are paid.
4. A tax on all unused land.
5. Assistance and encouragement of agriculture as the basic industry upon which the welfare of the people and the winning of the war depend.
6. Government operation of all plants manufacturing munitions ("profit-making in munitions of war is repugnant to every American citizen").
7. All industries in which industrial disturbances occur which cannot be settled by Federal mediation should be taken over and operated by the Government.

The League in Minnesota decided to coöperate with organized labor in cities and towns in local and Congressional nominations. The convention named a set of state candidates who were to run in the Republican primaries, except the candidate for treasurer, who (being a Democrat) should run in the Democratic primaries. It was expected in this way to get control of the Republican Party in Minnesota. The League's candidate for governor, ex-Representative Lindbergh, was defeated for nomination in the June primaries by Governor Burnquist.

The League's programme is to enlarge its activities and apply to national legislation the policies that have worked so successfully in some of the states. Its advocates hold that if public ownership and control is good for the nation in war, it will be good for the nation in peace. The farmers will seek to combine with the industrial workers for the purpose of reducing the number of profiteers and middle men in the process of distributing products from producers to consumers.

A Ten Days' Campaign.—No active party campaign for the control of the next Congress was entered upon until late in October. Interest in the war, desire for national unity, and nonpartisan support in its conduct, precluded partisan rivalry and divisions in appealing openly for party support among the voters. The epidemic of influenza throughout a large part of the country placed a ban upon public meetings and this usual method of party agitation and appeal was cut off. Billboard advertisements, broadsides in the newspapers, party circulars, pamphlets, letters and documents, activity in personal work in local, district, and state organizations,—these were the methods resorted to to reach and influence the voters. Both parties united their influences and official forces to make the Fourth Liberty Loan campaign a success. While the loan "drive" was on in October, Mr. Hays, the Republican national chairman, issued a public appeal to all Republican state chairmen throughout the country urging them to drop politics in order to promote the success of the loan. Chairman Hays urged that there should be no contest as to anything touching the war except "who best can serve who most can give." Simeon D. Fess of Ohio, chairman of the Republican Congressional Committee, announced that no active political campaign would begin till the drive for the Fourth Liberty Loan should end on Oct. 19. He announced that the Republican demand, after the campaign opened, would be "the more vigorous prosecution of the war." He recognized that such issues as involved a sharp party division were lacking. This he attributed to the fact that for the duration of the war the Republican Party had abandoned the ordinary function of a minority party, which is to hold up and oppose legislation by the majority.

The President's Appeal for the Election of a Democratic Congress.—The "adjournment of politics" came to a sudden end by the action of President Wilson. Ten days before the election (Oct. 25) the President issued an appeal to the country requesting the voters, as an expression of approval of his course, to elect only Democratic candidates to Congress. He based his public letter on the ground that the election of an opposition House and Senate would be construed as a vote of lack of confidence in his leadership and conduct of the war. The President, after calling attention to "the most critical period our country has ever faced or is likely to face in our time," said:

> If you have approved of my leadership and wish me to continue to be your unembarrassed spokesman in affairs at home and abroad, I earnestly beg that you will express yourselves unmistakably to that effect by returning a Democratic majority to both the Senate and the House of Representatives.
>
> I am your servant and will accept your judgment without cavil, but my power to administer the great trust assigned to me by the Constitution would be seriously impaired should your judgment be adverse, and I must frankly tell you so, because so many critical issues depend upon your verdict. No scruple of taste must in grim times like these be allowed to stand in the way of speaking the plain truth. . . .
>
> The leaders of the minority in the present Congress have unquestionably been pro-war, but they have been anti-administration. At almost every turn since we entered the war they have sought to take the choice of policy and the conduct of the war out of my hands and put it under the control of instrumentalities of their own choosing.
>
> This is no time either for divided council or divided leadership. Unity of command is as necessary now in civil action as it is upon the field of battle. If the control of the House and the Senate should be taken away from the party now in power, an opposing majority could assume control of legislation and oblige all action to be taken amidst contest and obstruction.
>
> The return of a Republican majority to either house of Congress would, moreover, be interpretative on the other side of the water as a repudiation of my leadership. Spokesmen of the Republican Party are urging you to elect a Re-

> publican Congress in order to back up and support the President, but even if they should in this impose upon some credulous voters on this side of the water they would impose on no one on the other side. It is well understood there, as well as here, that the Republican leaders desire not so much to support the President as to control him.

The President then spoke of the allied countries "with whom we are associated against Germany." He deemed them familiar with the significance of elections and that they would find it difficult to believe that the American voters were supporting their President if they elected to Congress a majority not in sympathy with his administration. The President concluded his appeal as follows:

> I need not tell you, my fellow-countrymen, that I am asking for your support not for my own sake or for the sake of a political party, but for the sake of the nation itself, in order that its inward unity of purpose may be evident to all the world. In ordinary times I would not feel at liberty to make such an appeal to you. In ordinary times divided counsels can be endured without permanent hurt to the country, but these are not ordinary times.
>
> If in these critical days it is your wish to sustain me with undivided minds, I beg that you will say so in a way which it will not be possible to misunderstand either here at home or among our associates on the other side of the sea. I submit my difficulties and my hopes to you.

This letter coming from the President acting as a party leader drew the fire of the Republican opposition. The next day the Republican leaders in Congress issued to the country a reply to the President. This Republican rejoinder was signed by Henry Cabot Lodge of Massachusetts, the Republican leader in the Senate, and by Frederick H. Gillett, the party leader in the House, also by Senator Reed Smoot of Utah and Representative Fess of Ohio, chairmen of the Senate and House Republican Campaign Committees. This party manifesto indicated that the President's appeal for Democratic candidates was to be interpreted as meaning that party politics was again convened and that during the few days left before the election there would be a vigorous party fight for the control of Congress. The Republican leaders sounded a note calculated to stir Republican workers throughout the country to renewed and vigorous political and party activity. The manifesto rebuked the President for having said that politics was to be adjourned, and then

> in the closing days of the campaign—delayed by the united efforts of all parties for the Liberty Loan—now, when all public meetings have been given up owing to the influenza epidemic, the President sends out a direct party appeal calling upon his countrymen to vote for Democrats because they are Democrats, without reference to whether such Democrats have been, or are, in favor of war measures and have a war record which deserves support.

The Republican leaders cited the President's support of Henry Ford in Michigan for Senator, despite Ford's misguided advocacy of peace, on the sole ground that Ford would blindly support the President. The Republicans should insist upon having some share in the government of the country, and they should not merely be used as the President seemed to wish to fight and die and serve and pay taxes in support of a party war. The Republican Congressional leaders pointed out some of the things their party would do if it should come into control of the House:

> They will replace Mr. Dent, of Alabama, at the head of the Military Affairs Committee with Mr. Julius Kahn, to whom the Administration was obliged to turn for assistance to take charge of and carry the first draft bill against Mr. Dent's opposition. They will put a Republican at the head of the Ways and Means Committee as leader of the House, instead of Mr. Kitchin of North Carolina who voted against the war. They will give the country a Speaker who did not oppose and would never oppose a draft bill and would never say, as Mr. Clark did, that "there is precious little difference between a conscript and a convict."

The statement went on to show how the Republican minority in Congress had supported the war and the Administration, and the country was assured that if the Republicans had a majority in Congress, the war would be pressed with greater vigor than ever before, "and that the party would stand for a victorious peace and the overthrow of Prussian militarism," and "that knowledge will not depress the spirit of our allies or encourage the Government of Germany." The manifesto concluded as follows:

> The Republican Party believes that the question of surrendering should be left to Marshal Foch, to the generals and to the armies in the field. When they report that Germany has laid down her arms, the United States and the Allies should then impose their terms. Will that knowledge cause dejection to those who are fighting with us? All the world knows that the Republican Party is opposed to negotiations and discussion carried on in diplomatic notes addressed to the German Government. The Republican Party stands for unconditional surrender. There is no Republican creed so short that there is not room for it in those two words.

Two days later (Oct. 27) Chairman Hays of the Republican National Committee, issued an address to the Republicans of the country calling upon them to take up what he termed the challenge of the President in questioning the motives and fidelity of the Republican members of Congress in his appeal to elect only Democrats in November. Mr. Hays denied that the Republicans in Congress had sought to take the control of the war out of the President's hands, and he characterized the charge to that effect as an insult, not only to every Republican in Congress, but to every loyal Republican in the land. He hoped it would be resented at the polls, as

> a more ungracious, more unjust, more mendacious accusation was never made by the most reckless stump orator, much less by a President of the United States, for partisan purposes. . . . Mr. Wilson wants only rubber stamps, his rubber stamps in Congress. . . . He calls for the defeat of pro-war Republicans and the election of anti-war Democrats. He as the Executive is no longer satisfied to be one branch of the Government, as provided by the Constitution. Republican Congressmen must be defeated and Democratic Congressmen must, as they would, yield in everything. That is evidently his idea,—the idea of an autocrat calling himself the servant, but bidding for the mastery of this great free people.

Mr. Hays, reiterating that no one sought to take from the President the conduct of the war (as commander-in-chief of the military and naval forces), asserted that the President sought two things:

> One is full power to settle the war precisely as he and his sole, unelected, unappointed, unconfirmed personal adviser [referring to Colonel House] may determine. The other is full power . . . to reconstruct in peace times the great industrial affairs of the nation in the same way, in unimpeded conformity with whatever socialistic doctrines, whatever unlimited Government-ownership notions, whatever hazy whims may happen to possess him at the time, but first and above all with absolute commitment to free trade with all the world, thus giving to Germany out of hand the fruits of a victory greater than she could win by fighting a hundred years.

The Republican chairman here refers to the third of President Wilson's "fourteen points" (see II, *International Relations*), referring to the "removal of all economic barriers and the establishment of an equality of trade conditions among all the nations consenting to the peace." This had been made use of for party purposes by the President's political opponents as if it threatened the safety of the American protective tariff, and the Republican chairman now applied it with this purport, in connection with a passage from a current interview with Henry C. Emery, former head of the Tariff Commission, who had said that Germany was now looking to President Wilson for salvation in a peace that will permit economic development to all nations alike. Mr. Hays agreed with Prof. Emery that the President was now the sole source of Germany's hopes; "all others demand that the Germans shall pay the full penalty of their crimes." It was then an issue "between a Republican Congress pledged to unconditional surrender and protection to American industries and American workingmen, or a Democratic Congress ready to assent to a negotiated peace and free trade."

Mr. Hays again protested against the war's being made a party asset and he charged that the Democrats were seeking to make it so. He then sought to arouse the activity of his party workers and the resentment of his party voters against what the most of them believed to be an unwonted interference, if not dictation, by the President in the election:

> This is a call to all loyal Republicans, proud in their patriotism, to stand by their country and their candidates, and to let the world know that America spurns autocracy no less at home than abroad and will uphold her allies in whatever reparation they may exact for the frightful outrages inflicted upon them by the accursed Huns. We are fighting in France to make certain forever that men may have the right to govern themselves. Here where we have

> that right we shall exercise it now and always. America was created for that very privilege. America will not be denied it now. America will answer with her vote.

Republican Leaders in the Campaign.—In a speech in Carnegie Hall, New York, on Oct. 28, Ex-President Roosevelt arraigned the President for his letter. Mr. Roosevelt said that the President had now reversed and repudiated his announcement of a few months before that "politics is adjourned" and that in so doing he had cast the gravest doubts on the sincerity of that announcement. He asserted that if the President were right in his appeal, then Republican voters would

> have no right to vote at this election or to discuss public questions while the war lasts. . . . If his appeal is justified, only that faction of the Democratic Party which accepts toward the President the rubber-stamp attitude of complete servility is entitled to control Congress. . . .
>
> Mr. Wilson applies the most rigid party test. He explicitly repudiates loyalty to the war as a test. He demands the success of the Democratic Party, and asks the defeat of all pro-war men if they have been anti-Administration. He asks for the defeat of pro-war Republicans. He does not ask for the defeat of anti-war Democrats.

Mr. Roosevelt thought that being "anti-Administration" was not a sufficient reason for excluding a man from Congress if it was anti-Administration

> to demand that our gallant men at the front should receive the guns and rifles and tanks and airplanes and shoes and clothing for which Congress had appropriated so many billions of dollars. The entire offense of the Republican leaders in Mr. Wilson's eyes is that they have demanded that inefficiency, waste and extravagance be remedied. Such a demand he treats as anti-Administration. . . . I hold, on the contrary, that these Republican leaders have in a great crisis shown complete indifference to party and complete devotion to the Union. They have disinterestedly supported Mr. Wilson in everything he did that was right and fearlessly opposed him where he was wrong. . . .
>
> President Wilson says the Republicans are not good enough to serve the Republic in Congress at this time. But they are good enough to die for the Republic in the Army and Navy. They are good enough to pay taxes and subscribe to the loan. We have sent our sons and brothers to spill their blood like water overseas under the flag, we have given our strength and our money without stint to serve the country at home, to float the loans, to back up the war activities of every kind; and now we are told that the blood of our sons, and the money saved at the expense of our wives and little children, do not entitle us to any word in saying how the war is to be waged or what are the terms on which peace is to be made, or what shall be our places after the war.

Ex-President Taft joined in the chorus of opposition to the President's partisan appeal. In a copyrighted article in the *Philadelphia Public Ledger* he called attention to the vast and unlimited power wielded by the President—more than ever before in the history of the country. This power was voted to him by Republicans in both houses of Congress, and the people, regardless of party, had refrained from protest against the exercise of this vast arbitrary power out of their anxiety to win the war. The President might disclaim partisanship but his appointment of agencies for the exercise of this power robbed his disclaimer of all point. His great war measures could have been obtained only by Republican support and but for that support he could not have conducted the war to its present status. Mr. Taft also bluntly denied that the Republican leaders had sought to take the choice of policies and conduct of the war out of the President's hands:

> The difficulty with this statement is that it is not true. What the Republican leaders attempted was to furnish the President with an executive organization by which he might carry on the war more effectively. . . . The patriotism and usefulness of the Republicans as a minority in winning the war stand out so clearly as compared with that of the leaders of the Democratic majority that the Republicans may well go to the people on the issue which the President raises.

Mr. Taft had no fear that Republican success would be misunderstood abroad. The European peoples would know that Republican success would mean a more certain prosecution of the war to an unconditional surrender:

> The shiver which went through the hearts of the American people when the implied proposals of the President's first note for a negotiated peace were so quickly accepted by Germany was shared by all the brave but suffering peoples of our Allies. For reasons ap-

> parent to all, the real expressions of feeling in respect to President Wilson's utterances in England and France are restrained. But when the torrent of American public opinion compelled a gradual return toward a demand for unconditional surrender the joy of our Allies was unrestrained. They know that a verdict at the election for a Republican House will end forever the dangers which seemed to face a negotiated peace.

Charles E. Hughes, speaking in New York on Oct. 29, attacked the President's appeal on similar grounds. The President, he said, must represent the whole thought of the nation.

> We are all for the war. We are unanimous in our earnest desire to drive through to complete victory. Let us have free expression, let us send our representatives to Congress, let there be fair and open discussion and free consultation and then we can trust the future. . . . We shall support the President as the President, not as the President of a party, not as the President of half the nation, but as the President of the entire nation as he acts according to the genius of our institutions, and we shall save him from the lesser dignity and influence of mere party leadership.

On Oct. 31 Mr. Roosevelt and Mr. Taft united in a joint appeal to the country for the election of a Republican Congress, said to be the first paper ever composed and signed by two former Presidents of the United States. These two prominent Republican leaders estranged since 1912 had been reconciled to social relations with one another in the early part of 1918. They now united in cordial joint political efforts against Mr. Wilson's party appeal. Their action typified old-time unity within the Republican Party.

The Republican leaders called the attention of the country to the big issues pending at the conclusion of the war and the coming of peace. They claimed their party had done its full share toward the winning of the war, and that it should have its full share in arranging the terms of peace. They opposed one-man control; the peace treaty must be accepted by the great body of the American people. The President's "fourteen points" were criticized as vague, and it was asserted that his exchange of notes with Germany had "caused a deep concern among our people lest he may by his parleying concede her a peace around a council table instead of a sentence from a court." The "fourteen points" should not be allowed to interfere with what our noble allies may justly demand.

> It is of capital importance, therefore, that we should now elect a Senate which shall be independent enough to interpret and enforce the will of the American people in the matter of the world, and not merely submit to the uncontrolled will of Mr. Wilson. . . . It is not safe, not in accord with the traditions of the Republic, to entrust to one man such unlimited power.

Congress had voted billions of money to the war. There had been much waste and failure in its use. It would take generations to pay the debts that had been created; the people had a right to know how these enormous sums had been expended. "Only a Republican Congress will have the courage to exact a detailed and accurate story of that stewardship." The work of reconstruction was not the work of one man. The President was not elected when such issues were before the people. His mandate of power was not given in the light of the momentous questions which will soon force themselves for solution. He was elected as a peace President and because "he had kept us out of war." "The American people should, therefore, place in the branch of the government charged constitutionally with adopting policies of reconstruction a Congress which will not register the will of one man, but, fresh from the people, will enact the will of the people."

The Democratic Argument. — The Democratic leaders and advocates defended the President and sought to justify his partisan appeal. Secretary McAdoo supplemented the President's appeal and called for "unity of command." This unity had been obtained on the battlefields of Europe through President Wilson's influence; it should be backed up in America by a Congress in full sympathy with the views, policies, and ideals of the American leader. Postmaster-General Burleson, who is generally credited with being the political spokesman of the Cabinet, expressed regret that partisanship had been injected into the Congressional contest, responsibility for which he charged upon the

Republican leaders. The Democrats insisted that in making his appeal the President had done only what Lincoln had done in the Civil War and McKinley in the Spanish-American War. The Senate remained in session up to the time of the election, but there was no quorum owing to the fact that many Senators had gone home to engage in political campaigning. The Republicans blocked efforts to adjourn, which, as the Democrats charged, was done merely from a desire to keep the Senate open for an airing of political views and to give the Republicans a chance to make party speeches on President Wilson's appeal for Democratic candidates. The Democrats charged the Republican leader with launching a series of bitter partisan attacks against President Wilson's leadership. They contended that the chief question was whether this leadership, which had been accepted by the statesmen of the Allied Governments, should be undermined or broken down. The President was a leading figure in the affairs of the world, and the people should see to it in November that the next Congress should be controlled by those who believe in the President and wish to work with him, and not by those who are against him. The Democrats called attention to the great and successful work of the war; that 2,000,000 men were overseas, well armed, well provisioned, in sound health, adequately trained, under competent military leadership. This war work and its leadership at home and abroad should be endorsed.

The Democrats also called attention to important and beneficent political measures, for peace and war, which gave them claim to a vote of confidence—the Federal reserve law which had successfully and completely reconstructed the finances of the country; the Farm Loan Act, of great benefit to the farming population; the War Trade Board; the Alien Property Custodian; the war-risk insurance; the Ship Purchase Act; the successful management of the railroads, telephone and telegraph systems, raising the wages of railway men without impairing the railway service; the laws in the interest of labor and of vocational education; the efficient handling of the Treasury Department and the Liberty Loans,—for all these the Administration and its party deserved the approval of the voters.

Election Results.—The election on Nov. 5 resulted in a Republican victory. That party carried a majority in both houses of Congress, turning a Democratic majority of five in the present House into a Republican majority of 45, and a Democratic majority of 10 in the Senate into a Republican majority of two. Speaker Champ Clark, of Missouri, very narrowly escaped defeat, while a solid Republican delegation was elected from Indiana. The party line-up in the next House will be as follows: Republicans, 239; Democrats, 194; Independent, one; Socialist, one. Victor Berger of Milwaukee is the Socialist member. He has been convicted of violating the Espionage Act, and he will probably be disqualified or unseated.

Among the more notable results of the Senatorial elections were the defeat of Henry Ford in Michigan by Commander Truman H. Newberry by a very small margin; the defeat of the Republican Senator Weeks in Massachusetts by Ex-Governor Walsh, who will be the first Democratic Senator from Massachusetts within a period of 70 years. Senator Weeks' defeat was largely the result of the active opposition of the women suffragists. The women suffragists also scored heavily in promoting the defeat of Senator Saulsbury of Delaware and the election of Governor Walter E. Edge of New Jersey, a friend of their cause, although the women failed to defeat the aged Senator Baird of New Jersey, Republican candidate for the short term (to March 4, 1919), who had also opposed the Federal suffrage amendment, having been appointed to fill the vacancy caused by the death of Senator Hughes. Senator James Hamilton Lewis of Illinois, the Democratic "whip" in the Senate, was defeated by Medill McCormick; Senator Norris of Nebraska, Progressive Republican, was reëlected, though credited with being a pacifist and with having an unsatisfactory war record. Joseph W. Folk of Missouri was unexpectedly defeated by Judge Selden Spencer, Republican—a result which was to be attributed, in part, to the opposition of the liquor interests and of the pro-Germans to Mr. Folk. Governor Arthur Capper was elected to the Senate from Kansas.

About half of the states elected governors. The greatest interest was taken in the result in New York, where Alfred E. Smith, a Tammany Democrat, was elected over Governor Whitman by a majority so small that it appeared for a time that a contest or a recount might be necessary to determine the choice. Lieutenant-Governor Coolidge, Republican, was elected governor in Massachusetts, Mr. Cox, Democrat, in Ohio, and Governors Philipp and Burnquist, Republicans, were reëlected in Wisconsin and Minnesota. It was said that the West had swung to Republicanism and the East to Democracy, but it will be seen from the returns that this generalization will not hold good. Rhode Island, New Hampshire, and Maine went Republican. Governor Whitman's defeat in New York was partly personal, partly on account of a factional fight of the standpat "Old Guard" against him, and partly because of the opposition of the liquor forces, who were displeased with the Governor's advocacy of New York's ratification of the Federal prohibition amendment.

Pending Issues.—The year closed with a prospective fight among the Republicans in Congress for the Speakership of the House and the control of the committee chairmanships in the Senate. A party fight is also presaged in the issues arising in connection with Government operation of the express, telegraph, telephone, cable, and railway systems. Certain Republican Senators and Representatives are organizing a movement in legislation designed to restore these agencies to private control. With this and similar old-line policies in view, these Republican leaders announce, through a party caucus in Congress, that they will seek to curb the greatly increased powers of the President and to recover for Congress its due powers and functions, "to prevent further usurpation by the Executive" and "to return to Congress the powers and authorities bestowed by the Constitution." Congress, not the President, should "give orders for the conduct of the Government," and Congress should assert and exercise its normal and constitutional functions in legislation necessary for reconstruction.

WAR ORGANIZATION

W. F. Willoughby

GENERAL ADMINISTRATION

Introduction. — A feature distinguishing the recent great war from all other wars in which the United States has been engaged is that it necessitated the mobilization of practically the entire resources of the country for its successful prosecution. To effect this mobilization the Congress had to pass a great body of special legislation extending the powers of the Government over these subjects and creating, or making provision for the creation of, a large number of special services through which these powers might be exercised. The present contribution has for its purpose to attempt a methodical survey of these special war agencies and a description of their operations in so far as they are not adequately covered elsewhere in this or the preceding issue of the Year Book.

The Problem of General Administration.—Among the problems of organization for the prosecution of the war none was of greater importance or of more immediate urgency than that of general administration. This problem consisted in the perfection of means by which a general programme of operation might be formulated, the several feaures of this programme allotted to the services best fitted for their performance, and measures of control established to insure that the programme as thus formulated and assigned should in fact be efficiently carried out.

The President as Administrator-in-Chief.—On the outbreak of the war the National Government was wholly without any such organ of general administration except in so far as the President and his Cabinet constituted such an organ. Though constitutionally the President's powers are exclusively executive as distinguished from administrative, the President has nevertheless become in effect the administrator-in-Chief of the Government, chiefly from the fact that Congress has by statute conferred upon him administrative powers of the most comprehensive character. Especially has this policy been pursued by Congress since the entrance of the United States into the war. In almost no case did Congress attempt itself to prescribe the character of organization or the administrative methods that should be employed in enforcing the large volume of war legislation that it enacted. Almost invariably it contented itself with providing that the President should take such action as in his opinion was wise to see that the provisions of those acts were properly carried out. By an act approved May 20, 1918, known as the Overman Act, it went much further even than this, and conferred a general power upon the President, during the war and for six months after its termination, to effect such a coördination or consolidation of existing bureaus, agencies and offices of the Government as in his opinion would lead to a more efficient prosecution of the war (see also *Congress and Administration, supra*).

Though possessing adequate powers to exercise that general direction, supervision and control over the formulation and execution of work programmes which has been shown to be necessary, the President, it is evident, could not personally handle more than a small fraction of the work that had to be done. He consequently brought into existence the large number of special war agencies which are described in the following pages. Before entering upon a description of these special services, an account should first be given of an agency which was established to handle the more general problems of administration to the end that unity of policy, programme and operation might be secured.

The Council of National Defense.—Prior to the outbreak of the war recognition was had of the need for some organ which should have as its function the formation of a general war programme and the correlation of the activities of the several branches of the Government for its execution should the United States ever be called upon to engage in a conflict that would measurably tax its resources. To this end there was drafted as early as 1912 a bill providing for the creation of a body to be known as the Council of National Defense. As the possibility of the United States being drawn into the war became progressively more apparent, this idea of a Council of National Defense was revived in a modified form and provision was made for its establishment by a clause inserted in the Army Appropriation Act of March 29, 1916 (*A. Y. B.*, 1916, p. 4). This Act provided for the creation of a body to be known as the Council of National Defense to consist of the six secretaries of War, Navy, Interior, Agriculture, Commerce, and Labor. The function of this body was stated in exceedingly broad terms to be "the coördination of industries and resources for the national security and welfare." For the performance of this function the Council was empowered to employ a director, experts and other necessary assistants, to organize subordinate bodies, and to create committees of specially qualified persons to serve without compensation, whose operations, however, should be directed and supervised by it. The Act made an immediate appropriation of $200,000 for the support of the Council and its work. Since then additional appropriations have been made in subsequent appropriation acts. In addition to creating the Council proper the act also made provision for the establishment of an Advisory Commission to the Council to consist of seven persons, to be appointed by the President upon the recommendation of the Council, each of whom should be specially qualified in some line which would make his services of value to the Council.

Though the Act authorizing the establishment of the Council and the Advisory Commission was approved on Aug. 29, 1916, it was not until Oct. 11 of that year that those two bodies were formally organized. The Secretary of War was designated as chairman of the Council, and Walter S. Gifford, statistician of the American Telephone and Telegraph Co., was appointed director. The Advisory Commission was constituted by the appointment of the following as its members: Daniel Willard, President of the Baltimore & Ohio R. R.; Hollis Godfrey, president of the Drexel Institute of Philadelphia; Howard E. Coffin, vice-president of the Hudson Motor Co. of Detroit; Franklin H. Martin, secretary of the General American College of Surgeons of Chicago; Bernard Baruch, a banker of New York; Julius Rosenwald, vice-president of Sears, Roebuck & Co. of Chicago; and Samuel Gompers, president of the American Federation of Labor. For the performance of their duties both the Council and the Advisory Commission organized a large number of divisions, sections and committees, the membership of which was largely composed of prominent persons who placed their services at the disposal of the Council without compensation. This system of committees, boards and sections underwent constant change both in regard to their character and personnel.

There can be little question that the organization of the Council and the Advisory Commission as thus effected is open to many criticisms. Not only did the Council apparently fail to appreciate its possibilities as a body to formulate general plans for the mobilization of industry, but there is no evidence that in creating its organization units it formulated or pursued a consistent programme even for its own activities. Its failure properly to correlate with its own the activities of the Advisory Commission led to much duplication both of organization and of function. The tendency of the committees to ignore the fact that their powers were limited to investigation and recommendation and to assume administrative functions led to friction with other agencies, although it must be conceded that in many cases they facilitated the placing of war orders. Finally, the great mistake was made, in organizing committees to consider the problem of securing materials and supplies needed by the Government for the prosecution of the war, of making these committees agencies for representing the Government in their relations with producers and manufacturers instead of agencies for the representation of such producers. As the members of these committees were in many cases the persons to whom the Government had to look for the supplies needed, a situation was brought about where the committees had to recommend the placing of contracts with their own members. This error, however, was in time appreciated and the committees reconstituted upon the other basis in the formation of the War Industries Board (see *infra*).

In thus criticizing the Council for its failure to work out for itself a consistent and carefully planned programme and to provide for a proper organization for its execution, it is not intended to convey the impression that the work of the Council was without value. Certain of its boards and committees, such as the Committee on Labor, Committee on Women's Defense Work, General Munitions Board, Munition Standards Board, General Medical Board, and the Committees on Transportation and Supplies, of which there were a large number, did exceedingly valuable work. The work of a number of these bodies will be considered in other connections. After all, however, the chief service rendered by the Council, and particularly by its Advisory Commission, was that of furnishing the means through which the officers of the administrative departments could get into immediate touch with the industrial interests of the country. It should be borne in mind that, at the time the Council was created, the Government had none of the special agencies later created with which to handle special war problems. The Council furnished the only body fitted to handle these questions pending the establishment of these agencies, and it rendered valuable assistance in doing so. In a number of instances, notably in the case of the War Industries Board and the Commercial Economy Board, the units established by the Council were taken over by the President and made independent agencies or integral parts of such agencies.

With the establishment of these special agencies the field of activities of the Council became steadily more restricted until at the termination of hostilities it played a comparatively unimportant part in the general organization for the prosecution of war, and it has now turned its attention largely to the consideration of the problems of reconstruction to be met after the war is over.

MOBILIZATION OF SCIENCE

The National Research Council.—Another characteristic feature of the late war was the extent to which recourse had to be had to almost every branch of science in order to meet the technical problems to which its prosecution gave rise. In the National Academy of Sciences the Government had a body to which it could appeal for assistance in this field. This body has a quasi-governmental status, since it was specially chartered by Congress in 1863 and in this charter provision was made that "the Academy shall, whenever called upon by any department of the government, investigate, examine, experiment, and report upon any subject of science or art."

By a resolution adopted April 19, 1916, the Academy offered to organize the scientific resources of educational and research institutions in the interests of national preparedness. This offer was accepted by the President on April 26, 1916, and the Academy was requested to proceed at once with the work. To put its plans into execution the Academy organized a special body to which it gave the name National Research Council, the establishment of which was formally approved by the President on July 24, 1916, who at the same time provided for the representation on it of the Army, Navy, and various scientific bureaus of the Government. On May 11, 1917, the President issued an executive order reciting the organization of the National Research Council, expressing appreciation of its work, requesting the National Academy of Sciences to perpetuate it, and specifying in considerable detail the nature of the duties it should perform. This order stated that inasmuch as the effective prosecution of the Council's work would require the cordial collaboration of the scientific and technical branches of the Government, the President, on the nomination of the National Academy of Sciences, would designate as members of the Council the heads of the services immediately concerned.

The Council was duly organized with George G. Hale as its chairman, Charles D. Walcott, Gano Dunn, and R. A. Millikan, as first, second and third vice-chairmen, and Cary T. Hutchinson as secretary. As members of the Council were appointed the heads or representatives of nearly all of the scientific bureaus of the Government and a large number of the leading scientists of the country. The Council thus became an agency for mobilizing the scientific talent of the country for war purposes and as such it rendered immensely valuable services, which, however, still remain largely confidential.

The Naval Consulting Board.—The National Research Council had to do with matters of scientific research generally. To undertake the examination and development of inventions or new devices that might prove of value in the prosecution of the war, the Government had at hand another body known as the Naval Consulting Board. Though technically this Board was an adjunct of the Navy Department, practically it became an agency available to all branches of the Government. This arose from the fact that, after it had been created by the Navy Department, its services were offered to and accepted by the War Department, and the Council of National Defense, by a resolution adopted Feb. 15, 1917, made it its Board of Inventions.

The organization of this Board originated with the Secretary of the Navy, who, in the fall of 1915, invited Thomas A. Edison to assume supervision over the examination of new inventions offered to the department (*A. Y. B.*, 1915, p. 317). The legal existence of the board was established by the Act of Aug. 29, 1916, which made an appropriation of money for its support. It was formally organized on Sept. 19, 1916, when the members were appointed and took their oaths of office. As now organized the board is composed of 24 members. Mr. Thomas A. Edison is its president, P. C. Hewitt its vice-president, W. S. Saunders its chairman, and Thomas Robbins its secretary. In handling its work the Board created numerous technical committees.

MOBILIZATION OF PUBLIC INFORMATION

The Committee on Public Information.—Almost immediately on the entrance of the United States into the war, it became apparent that special provision should be made, on the one hand, to control the giving of information to the public regarding matters of military import, and, on the other, to make known in an authoritative manner such information as it was desirable that the public should have. On April 13, 1917, the Secretaries of State, War and the Navy addressed a joint letter to the President calling this matter to his attention and suggesting that there be created a body to be known as the Committee on Public Information which should have in charge these two functions of censorship and publicity. Acting on this recommendation, the President, by executive order issued April 14, 1917, provided for the creation of this Committee, specifying that it should consist of the Secretary of State, the Secretary of War, the Secretary of the Navy, and a civilian who should act as the executive head of the Committee. George Creel was named as the civilian member.

In considering the work of this committee it is well to distinguish between its two functions as a censorship board and as an organ of publicity. In respect to the first it should be noted that the functions of the Committee related wholly to the control of publications inside the United States. It had no duty in respect to the censoring of communications passing between the United States and other countries, the control of such communications being vested in a Censorship Board to be hereafter described. The situation as regards the control of the domestic press at the outbreak of the war was one where the Government not only had little or no positive powers to control such publications, but was loath to seek enlarged powers owing to the strong adherence of the American people to the principle of the freedom of the press. The Government therefore decided that such measures of control as it would seek to exercise should be in the way of making an appeal to the press of the country voluntarily to refrain from the publication of information that might be of value to the enemy or embarrass the Government in its operations at home. To the Committee on Public Information was entrusted the duty of making this appeal to the press and of taking such steps as were in its powers to see that its appeal was met. The Committee accordingly prepared and issued to the press a carefully drafted statement setting forth the character of the information that the Government desired should not be given publicity, and the rules that should be observed by the press in giving information of a military nature or in commenting upon such news. In this statement it was carefully set forth that the regulations thus formulated were not of a legally binding character, but ones which it was hoped that the press would voluntarily observe.

The activities of the Committee as an organ of publicity were exceedingly varied and important. The Division of News centralized the giving out of information by the Army and Navy and other war agencies, and furnished to about 14,000 country newspapers and 2,000 papers in the smaller cities a weekly service of condensed war news of two or three columns in length. The Division of Civic and Educational Coöperation prepared and distributed to a total of over 18 million copies pamphlets having for their purpose the setting forth of America's side of the issues raised by the war, the correction of the enemy's misrepresentations, and the exposure of the aggressions and unjustifiable methods of prosecuting the war of which the enemy has been guilty; this Division also coöperated with the National Historical Board in promoting the proper study of modern history and with other organizations in the work of giving to students and teachers a knowledge of the historical background of the war and the fundamental issues that were involved in it. The Division of Syndicate Features secured the preparation by prominent writers of articles presenting the issues of the war, or treating other matters calculated to stimulate the patriotism of the people, for publication in such a way that they would get a large circulation. The Division of Foreign-Language Newspapers had the important duty of reading the papers received from Germany and Switzerland and preparing translations or digests of articles appearing in such papers to which it is desirable to give publicity, for the use of the Division of News and the Division of Syndicate Features; it also translated the more important pamphlets prepared by the Committee into foreign languages, prepared editorial and news matter for publication in the foreign-language, particularly the enemy-language, press of the country, and also acted as a translation service for the Department of Justice and Post Office Department. The Official Bulletin Division had charge of the preparation and issue of the *Official Bulletin of the United States*, published daily, except Sundays and holidays, from May 10, 1917, which furnished an exceedingly effective means of giving publicity to information regarding, not only the military, but the purely civil operations of the Government.

The Division of Four-Minute Men had the direction of over 15,000 men who volunteered to make four-minute speeches to motion-picture audiences during intermissions; through them it managed a number of campaigns for various purposes, the most important being for the sale of Liberty bonds. The Division of Public Speaking had as its function the coördination of the efforts of a dozen or more national speakers' bureaus; it filled requests for speakers and routed them throughout the country. The Division of Pictures issued permits for the taking of photographs of Government activities, decided what pictures might be published under the voluntary censorship, and distributed official photographs, drawings, pictorial records, motion pictures, war films, lantern slides, etc. The Division of Films made and distributed moving-picture films having for their purpose to inform the American public regarding the war activities of the Government. Other divisions mobilized the artists of the country for the preparation of posters and other pictorial means of appealing to the country, gave to the several departments of the Government an organized advertising service consisting of the volunteer help of all the national advertising agencies of the country, and made known to the inhabitants of the enemy and neutral countries America's ideals, aims and war activities, besides rendering other services too numerous to mention.

The Censorship Board.—All Governments in time of war have to take steps to prevent the disclosure to the enemy of information regarding their military plans and operations. They have also to take precautions against the spreading of misinformation, seditious utterances, the publication of seditious matter, or any action having for its purpose or effect to lend aid and comfort to the enemy or to embarrass the Government in securing the enforcement of all laws enacted by it. In no war has action of this kind been more necessary than in the one just ended.

The first step taken to meet this situation in the United States was the issue by the President of an executive order dated April 6, 1917, directing the Secretary of the Navy to assume control over all means of radio communication. This order was issued in pursuance of the Act to Regulate Radio Communication, approved Aug. 13, 1912, which authorized the President to take over on behalf of the Government all radio stations within the jurisdiction of the United States that might be needed by the Government in the event of war for naval communications and to control or close all other radio stations. On April 28, 1917, the President issued another executive order prohibiting all telegraph, telephone and submarine cable companies from transmitting messages to points outside of the United States and from delivering messages received from such points except as permitted under rules and regulations to be established by the Secretary of War for telegraph and telephone lines and by the Secretary of the Navy for submarine cables.

As the war progressed it became evident that the powers of the Government to prevent the imparting of information to the enemy, the securing of such information through acts of espionage, and the utterance and publication of matters of a seditious character or tending in any way to interfere with a due enforcement of the laws of the land or embarrass the Government in its effort to secure a successful promotion of the war, would have to be increased. This need of additional power of an affirmative character was met by provisions inserted in the so-called Espionage Act of June 15, 1917 (*A. Y. B.*, 1917, p. 12), the Trading with the Enemy Act of Oct. 6, 1917 (*A. Y. B.*, 1917, p. 516), and the Act of May 6, 1918, amending the first named Act (see *Congress and Administration*, *supra*). The provisions of these acts taken together were extremely comprehensive and drastic in character. The first named as amended May 6, 1918, was indeed of an unexampled nature.

The Trading with the Enemy Act conferred upon the President complete power to censor all communications of every sort passing between the United States and any foreign country. It also subjected the foreign-language press of the country to special regulations to insure that use should not be made of such press to assist the enemy in any way to promote trouble in this country or to induce persons to refrain from loyally supporting the Government and all of its laws. By executive order dated Oct. 12, 1917, the President designated the various agencies which should have charge of the administration of the several features of the Trading with the Enemy Act. For the censoring of news coming from or going to foreign countries this order created a body to be known as the Censorship Board to be composed of representatives of the Secretary of War, the Secretary of the Navy, the Postmaster-General, the War Trade Board, and the chairman of the Committee on Public Information. The enforcement of the provisons regarding the foreign-language press was vested in the Postmaster-General.

MOBILIZATION OF FINANCE

Financial Preparedness.—Whatever criticism may be directed against the United States for its failure to prepare itself for war cannot refer to the important department of finance. In the passage of the income-tax amendment to the Constitution and of the Federal Reserve Act the National Government took two steps towards military preparedness, the importance of which it is impossible to exaggerate. Due chiefly to these two measures, both of which antedated the war by only a few years, the United States was able to meet all of the financial problems presented by the greatest war of history with a minimum interruption to the normal financial life of the community.

Interesting and important as was this phase of the war activities of the Government, it is one into which the present account cannot enter (see *A. Y. B.*, 1917, p. 349). There were, however, certain special problems of a financial character that gave rise to the necessity for the creation of special war agencies for their meeting. Reference is made to the problem of the mobilization of the capital resources of the country for war purposes. This had two phases, (1) the limitation on the issue of new securities by bodies other than the National Government to the end that the supply of capital available for investment might be employed solely for the purpose of meeting war needs, and (2) the furnishing of capital by the Government to those undertakings engaged in war work or in meeting the essential needs of the community, where such undertakings were unable to secure such capital upon reasonable terms. To meet these two phases the Government brought into existence two special war agencies known as the Capital Issues Committee and the War Finance Corporation.

The Capital Issues Committee.—The first step towards the mobilization of loanable capital for war purposes was made by the Secretary of the Treasury. In his report for 1917 he called attention to the desirability of avoiding all unnecessary capital expenditures. Following this up, he requested the Federal Reserve Board, of which he was *ex officio* chairman, to take such action as was within its powers in this direction. This the Board did by the organization of a Capital Issues Committee, and the dispatch of a request to all banks and other institutions having to do with the issue or underwriting of securities to refuse to undertake the issue of new securities until their desirability had been passed upon by the Committee. To assist the Committee in its work provision was made for a local capital issues committee for each Federal reserve district with headquarters at the Federal reserve bank of the district. The plan provided that all applications for the approval of security issues should be made to the central Committee, which would, where necessary, refer them for consideration and advice to the appropriate local committee.

Notwithstanding the results accomplished by this Committee, it became more and more evident that the work being done by it should be put upon a legally sanctioned basis. Upon the recommendation of the Secretary of the Treasury, Congress, therefore, through the passage on April 5, 1918, of what is known as the War Finance Corporation Act, made provision for a Capital Issues Committee of seven members appointed by the President to take over the work of the old Committee (see XII, *The Conduct of Business*). Thereupon the old Capital Issues Committee of the Federal Reserve Board went out of existence. During its life it had passed upon the issue of securities to the total amount of $478,458,386. The 12 local committees in the Federal reserve districts were, however, preserved, and they continued to serve the new Committee in the same capacity as they had the old.

Although the new Committee was given Congressional recognition and an official status, its work still continued on a voluntary basis in the sense that firms and corporations were under no legal compulsion to submit their proposed issues of securities to the Committee or to abide by its decisions. Notwithstanding this, the Committee was able substantially to control the situation. This was due to the patriotic support and coöperation that it received from all the larger corporations, banks, and financial organizations generally. In its report submitted in December, 1918, the Committee stated that up to Nov. 11, 1918, it had received and passed upon 2,289 applications involving the issue of new securities to the face value of $2,564,021,000. Of this total approved by the Committee only $366,914,000, or 14 per cent., involved the use of capital, labor and materials for new construction and equipment, and of this amount $100,224,000 was in payment for work which had been performed or was under contract before the passage of the Act. Less than 11 per cent., therefore, of the total approved for issue was for new construction and equipment, and most of this was for extending and increasing the facilities of public-utility companies serving war industries (see also VI, *Municipal Government*).

The Committee has recommended unanimously that this work of Federal supervision of security issues be permanently continued after the conclusion of the war by some Government agency "in such form as to check the traffic in doubtful securities while imposing no undue restrictions upon the financing of legitimate industry."

The War Finance Corporation.—Besides the negative function of the Capital Issues Committee in preventing the dissipation of loanable capital into enterprises not contributory to the prosecution of the war or the satisfaction of the essential needs of the community, the needs of the situation required affirmative action in the way of securing funds for those enterprises of an essential character which were unable to secure the money needed by them at a reasonable rate. The Secretary of the Treasury, therefore, urged upon Congress the creation of an agency for this purpose, which was accomplished by the passage of the War Finance Corporation Act of April 5, 1918. The Act provided for the creation of a War Finance Corporation with a capital of $500,000,000, all to be subscribed by the United States, and an appropriation of that sum was made for the payment of the stock. The management of the affairs of the Corporation was vested in a board of directors consisting of the Secretary of the Treasury as chairman and four other persons to be appointed by the President. The specific powers vested in the Corporation to carry out its purpose are summarized elsewhere (see XII, *The Conduct of Business*).

The Secretary of the Treasury stated in his report for 1918 that up to Oct. 31, 1918, applications for advances for an aggregate sum of $323,329,232.22 had been received by the Corporation, upon which advances to the amount of $67,716,342.49 had been made. The gross earnings of the Corporation up to that date had been $2,228,333.49. After deducting adminstrative expenses, amounting to $58,726.63, there remained the sum of $2,169,606.86 as net earnings.

War Credits Board.—In considering the work of the War Finance Corporation, account should be taken of the fact that the Government had in the revolving fund of the Railroad Adminstration (see *infra*) and in the War Credits Board of the War Department organizations performing substantially the same function in their respective fields. The War Credits Board was created by the Secretary of War for the administration of the provisions of the Urgent Deficiencies Act of Oct. 6, 1917, which provided that the Secretary of War, as well as the Secretary of the Navy, should have authority during "the period of the present emergency" to make advances from appropriations to contractors for supplies, such advances to be made subject to such conditions as he saw fit for the protection of the Government. That this authority might be properly exercised the Secretary of War created the War Credits Board to pass upon all applications from contractors for advances. Its authorization of advances ran into hundreds of millions of dollars, and undoubtedly very large sums were also advanced in this way by the Navy Department.

MOBILIZATION OF INDUSTRY

Status of Preparedness.—It has been pointed out that a prime characteristic of the recent war was the necessity for marshalling practically the entire industrial resources of the nation for its prosecution. The first step towards meeting this problem was taken as a matter of preparedness prior to the entrance of the United States into the war. The Naval Consulting Board (see *supra*) early in 1916 appointed a committee to make a survey of the nation's industrial facilities. This committee, under the direction of Howard E. Coffin, made an ambitious attempt to list, describe and classify all the industrial establishments of importance of the country. That this inventory was of some value is probable. It does not appear, however, that very large use was made of it. It was prepared at a time when the nature of the problem and the character of data needed were not clearly determined.

In the same year the Secretary of War, under authorization of the National Defense Act of June 3, 1916, appointed the so-called "Kernan Board" to make an investigation of the country's munitions resources with a view to determinng the practicabilty of the Government's manufacturing its arms, munitions and equipment. The report of this board was published in Senate Document No. 644 on Jan. 4, 1917.

The War Industries Board.—Upon the creation of the Council of National Defense, that body immediately undertook, as one of its major activities, to carry forward this work of rendering available the industrial plants of the country for war purposes. By a resolution adopted Feb. 28, 1917, it created a body known as the Munitions Standards Board, to be composed of specially competent persons, who would serve without compensation, to coöperate with the War and Navy Departments in determining and adopting standards for the manufacture of munitions of war. Frank A. Scott was made chairman of this Board. A month later the Council by resolution adopted March 31, 1917, created another body known as the General Munitions Board to coördinate the munitions buying of the Army and Navy Departments and to assist in the acquirement of raw materials and manufacturing facilities to meet these requirements. The organization of this larger Board embraced the civilian personnel of the Munitions Standards Board and, in addition, had in its membership representatives from the supply bureaus of the War and Navy Departments. In the meantime the Advisory Commission of the Council created a number of committees of producers and manufacturers dealing with materials and manufactured articles entering into the production of munitions. To obviate the confusion and overlapping of jurisdiction and duties resulting from the foregoing, the Council, by resolution of July 28, 1917, created a new body, to which it gave the name War Industries Board, to take over the duties of the Munitions Standards Board and General Muntions Board, which bodies were abolished.

Notwithstanding the support that the President and the Secretaries of War and the Navy gave to the Board, the system under which its important duties were sought to be performed by a body which had no inherent administrative powers gave rise to many difficulties in practical operation. The services of the Government upon whom legal responsibility for action rested did not in all cases acquiesce willingly in the situation where it had to defer to determinations of another body. The necessity that they were under of doing so undoubtedly led at times to delay in the placing of important orders. The greatest weakness of the Board, however, lay in its lack of power to issue orders of mandatory force directly to the industrial and transportation interests of the country or to organize an administrative service for the enforcement of such orders.

Appreciation of these difficulties led to a strong demand on the part of the public, which was participated in to a certain extent by Congress, for the creation of a Ministry of Munitions or other organ having powers conferred by direct legislative grant to take the action required. The President, however, was opposed to the creation of such a body (see *Congress and Administraton, supra*). To meet the needs of the situation he decided to take the War Industries Board from under the Council of National Defense, make it an independent organ acting directly under his authority, and in so doing greatly to enlarge its powers. This he did by his letter of March 4, 1918, appointing Bernard M. Baruch as chairman of the Board, and outlining the duties of the Board on a much more comprehensive scale. This action was later more formally confirmed by an executive order dated May 28, 1918. The taking of the Board from under the Council of National Defense and making it an independent agency had the important consequence that thereafter the Board derived its legal powers direct from the President. Thus it had power to exercise, within its field, all the powers of the President over industry entrusted to him by statute or possessed by him in virtue of his position of head of the armed forces of the nation.

An analysis of the functions conferred upon the Board shows that it had to do the following things:

1. Act as an agency through which the war demands of the several services of the Government and of the public might be centralized to the end that the general procurement programme of the Government and the public, in so far as essential requirements were involved, might be formulated.
2. Take steps for the reorganization of the industrial resources of the nation so as to ensure that the requirements so made known would be met as completely and speedily as possible.
3. Determine priorities in respect to the production, delivery and use of materials and supplies.
4. Fix prices when such action was deemed desirable.
5. Encourage in every way possible, and if necessary, order producers and manufacturers so to conduct their enterprises as to insure that all unnecessary work would be eliminated, waste prevented, and all possible economics realized.
6. Have general charge of all purchasing for the Allies.

All of these duties were immediately entered upon with the utmost energy, and one step after another was taken with great rapidity, bringing the whole industry of the country under what amounted to a strong central direction and control. It is impossible to give an account of this action in detail. Some of the more important policies adopted and steps taken should, however, be described.

One of the first steps taken by Mr. Baruch was thoroughly to reorganize the Clearance Committee of the old Board, or rather to supplant it with a new service known as the Requirements Division of the War Industries Board. This Division was composed of Mr. Baruch himself, as chairman of the War Industries Board, the priorities commissioner (see *infra*), representatives of the more important commodity sections of the Board, and representatives of the War and Navy Departments, the Emergency Fleet Corporation, the Food, Fuel, and Railroad Administrations, the Red Cross, and the Allied Purchasing Commission—in other words, the chief Government agencies having to do with the purchase or supply of articles needed for the prosecution of the war. It was the function of this Divison to secure, as far in advance as possible, information regarding the prospective needs of the several services and to take the steps required for insuring that these needs would be met with the greatest possible dispatch. In carrying out the latter part of its task the Division made use of a large number of so-called "commodity sections" which constituted the backbone of the administrative system of the Board.

The second, and in many respects the most important, of the duties of the War Industries Board consisted in the organization of industry. In few respects did the Government find itself more handicapped upon its entrance into the war than in the absence of any such organization. It was impossible for the Government to get effective results under a system where it had to deal with individual firms. The situation was one where, having determined its requirements, the Government should be able to take up with each industry as a whole the matter of its ability to meet such requirements and allot orders in such a way that they would be most promptly met and justice be done as between individual firms.

In the account of the Council of National Defense (*supra*) the fundamental mistake made by that body in seeking to meet this need has been pointed out. It effected an organization of its own corresponding to trade lines, but at the outset at least took no steps for the organization of the industries themselves. It created committees and sections for particular classes of commodities, the members of which were largely composed of the leading producers of these commodities. These committees and sections were agencies of the Government, not representatives of the industries. This led to the anomalous position in which these bodies had to deal with themselves, in the sense that they had to recommend the placing of orders with firms in which they were interested and the prices and other purchase conditions that were to be observed. This was a condition so contrary to correct practice and so liable to lead to abuse, if not positive fraud, that it could not be allowed to continued. Congress accordingly inserted in the Food Control Act of Aug. 10, 1917, a stringent provision prohibiting any person representing the Government in any way from taking action looking to the placing of orders with firms in which he was interested. In the meantime the Council itself had come to a realization of its error and had taken steps to correct it. In this work the Council, acting through the War Industries Board, had the powerful coöperation of the Chamber of Commerce of the United States. That body in fact undertook the work of effecting such an organization. It was quick to see the great advantages that would accrue, in time of peace as well as war, through having the industry of the country organized on this national basis.

The War Industries Board had in its commodity sections technical units of organization that could represent it in its relations with these producers' committees. In addition to these technical sections the Board had also two divisions known as Resources and Conversion Division and Facilities Division, the functions of which were to take the steps necessary for the conservation of the resources of the country and their conversion to war needs. The duties of the former were, as indicated by its title, those of securing knowledge of industrial resources and their conversion to war purposes. In this work it was aided by a field establishment of 30 regional advisors appointed by the War Industries Board. This system was further perfected by the appointment of what were known as "sub-regional chairmen" in all of the important cities of each district. These sub-regional chairmen, unlike the regional advisors, were, however, representatives of the business men of their cities, and thus furnished the means through which the latter got into immediate touch with the business interests of their districts.

The third branch of the work of the War Industries Board was that of determining priorities. This authority had to be exercised in a number of ways. The Board had to determine the order of precedence of different industries in securing fuel and the raw materials needed by them in their operations when the supply was insufficient to meet all needs; the order of precedence to be observed by the railroads and other transportation agencies in hauling these materials or the products of industrial establishments; and finally, the disposition that should be made of products. The latter involved not only a determination of whether the Government, our allies, or individual concerns should get these products, but the particular ally or branch of our Government that should be preferred in respect to their receipt. It was through the use of this power and that of price fixing (see *infra*) that the Government, acting through the War Industries Board, took over the control, if not the detailed management, of the industries of the country. Though the Board had given to it no direct authority to issue priority orders having mandatory force except in the case of transportation, it had adequate powers to enforce compliance with any order or request of this character that it might issue by making use of its powers to control transportation or the supply of fuel or, in the last resort, to commandeer many classes of undertakings. Legally, therefore, the priority orders issued by the War Industries Board were, for the most part, but requests. Actually they had the force of orders since the firms affected knew that if they did not comply with them, their supply of fuel would be cut off, their materials and products would not be received for transportation, and in many cases that their establishments would be seized by the Government. Throughout its history, therefore, the Board had little or no trouble in securing compliance with all orders or requests issued by it.

A phase of the work of the War Industries Board was that of taking action looking to the putting of the industries of the country upon a more efficient basis. The Council of National Defense, almost immediately upon its organization, realized that one of the most effective means of increasing the man power and industrial resources of the nation for war work consisted in having the industrial and commercial undertakings of the country do everything possible to increase the efficiency with which their operations were conducted, to reduce waste in the use of materials, and to eliminate those services which were not absolutely essential for the conduct of their work. It accordingly, by resolution adopted March 24, 1917, provided for the creation of a board of five members to be known as the Commercial Economy Board, the duties of which should be "to investigate and advise in regard to the economic distribution of commodities so as to conserve both capital and personnel for the national defense." A. W. Shaw, editor of *System*, was made chairman of this Board. Early in May, 1918, it was transferred to the War Industries Board, where it was reorganized as a Conservation Division and the scope of its duties enlarged so as to cover the work of effecting economies in every branch of industry. (See also XII, *The Conduct of Business;* and XVIII, *Manufactures.*)

Another important branch of the work of the War Industries Board was that of determining the prices that should be paid for commodities, the inadequate supply of which prevented the adjustment of prices upon a fair basis through the working of competitive forces. This work was performed by a Price Fixing Committee composed of the chairman of the War Industries Board, the labor representative, and the two members of the Board concerning themselves with raw materials and manufactured products, the chairman of the Federal Trade Commission, the chairman of the Tariff Commission, the Fuel Administrator, and a representative of the supply services of the War and Navy Departments, respectively. In performing its function the Committee not only had the use of the technical sections of the War Industries Board, but made large use of the Federal Trade Commission when detailed studies of costs were desirable. One important class of commodities after another was taken up for consideration and the basic prices were determined and submitted to the President for approval. In general the Committee did not seek to fix retail prices. Its work was limited to the fixing of prices of raw materials and in the wholesale trade, and, on the basis of these, the working out of differential prices. In many cases the prices fixed were the result of a formal agreement entered into between the Committee and associations representing the trades affected. The chairman of this important committee was Robert Brookings. (See also XII, *The Conduct of Business.*)

The last of the functions of the War Industries Board that has been mentioned was that of acting as the agent of the Allies in making purchases in this country for war purposes. To prevent a situation where the several Allies would compete among themselves and with the U. S. Government the latter, acting through the Secretary of the Treasury, entered into a series of identical agreements with the several Allies by which it was agreed that all the latter's war purposes should be made through a commission of three members to be known as the Allied Purchasing Commission. As the members of this Commission were at the same time members of the War Industries Board, the work of the Commission was transferred to the latter body. The Commission, however, maintained its separate organization and thus became one of the primary divisions of the War Industries Board.

MOBILIZATION OF FOREIGN TRADE

Closely analogous to the necessity for the mobilization of industry for war purposes was that of the mobilization, in the sense of the establishment of rigid control, of foreign trade. This was due to a number of circumstances. In the first place many of our industries were directly dependent upon imports from abroad for their raw materials. In the second place the amount of tonnage available for the use of the United States was utterly inadequate to meet our needs. Thirdly, a rigid control over exports was essential to ensure that no American goods would reach the enemy either directly or indirectly through neutral countries, and that such of our goods as were available for export would go to those of our Allies as were most in need of them, or to those neutrals who would undertake to give to us or our Allies reciprocal advantages.

Provision was made for the establishment of such control by the so-called Espionage Act of June 15, 1917, which, among other things, conferred upon the President full power to control all exports from the United States (*A. Y. B.*, 1917, p. 515). The Trading with the Enemy Act of Oct. 6, 1917, conferred similar powers in respect to the control of imports and regulated in detail the whole matter of trading with the enemy or allies of the enemy (*A. Y. B.*, 1917, p. 516).

The War Trade Board.—To make effective the provisions of these acts the President by Executive Order of June 22, 1917, provided for the establishment of an Exports Council to act as an advisory body to him in administering the system of control over exports and vested the actual administration of the system in the Secretary of Commerce. On Aug. 21, 1917, the President issued another order superseding that of June 22, in so far as the vesting of the administration of the exports-control system in the Secretary of Commerce was concerned, and creating for this purpose a new body to be known as the Exports Administrative Board. The Exports Council was at the same time continued as an advisory body, but the membership was enlarged by adding to it the chairman of the Shipping Board.

On Oct. 12, 1917, the President took steps for the exercise of his powers for the control of imports and the enforcement of the provisions regarding trading with the enemy by the issue of an executive order setting forth in detail the manner in which the several powers conferred by the Trading with the Enemy Act should be exercised. This order, in addition to other things, made provision for two new bodies, to be known as the War Trade Council and the War Trade Board, which should supersede and take over the duties of the Exports Council and Exports Administrative Board, and in addition exercise control over imports and the trading with the enemy features of the Act. These bodies were given the same composition as the bodies they superseded. This order was subsequently amended by an Executive Order issued Aug. 20, 1918, providing that the composition of the War Trade Board should be changed so as to include representatives of the Secretary of State, Secretary of the Treasury, Secretary of Agriculture, Secretary of Commerce, the Food Administration, the U. S. Shipping Board, and the War Industries Board. Vance C. McCormick was made chairman of the Board and since its creation has been its active directing head.

The War Trade Board had three distinct duties, namely, control of exports, of imports, and of trading with the enemy. Steps were taken for the control of exports before the War Trade Board was created, that is, while such control was vested first in the Secretary of Commerce and later in an Exports Administrative Board. On July 9, 1917, the President issued a proclamation giving a list of articles, the exportation of which to certain enumerated countries was prohibited except as a license therefor was secured from the Secretary of Commerce in conformity with such rules and regulations and subject to such restrictions and limitations as the latter might prescribe. This original proclamation was supplemented by others issued Aug. 27, 1917, Sept. 9, 1917, Nov. 28, 1917, and Feb. 14, 1918, which combined had for their effect to subject practically all articles of export to a licensing control (see also XIX, *External Commerce;* and *A. Y. B.*, 1917, p. 320).

It was not until some months after exports had been subjected to control that similar action was taken in respect to imports. The first step in this direction was the issue by the President on Nov. 28, 1917, of a proclamation providing for a system of licensing imports analogous to that which had been set up for exports. This original proclamation was supplemented by one issued Feb. 14, 1918, so extending the system to articles not embraced in the first proclamation as to bring under it nearly all articles entering into our import trade. In operating this system the War Trade Board adopted the policy of working in the closest possible coöperation with the trades affected. This it did by encouraging the several trades most concerned to effect national organizations and appoint committees to represent them before the Board.

The control of trading with the enemy had in view not merely the prevention of commodities reaching the enemy country, but the rooting out of enemy trade throughout the world. To administer the system the War Trade Board created a special Bureau of Enemy Trade. The first task of this Bureau was that of securing a list of all firms throughout the world which were of a character bringing them within the intent of the law and with whom all trading by American citizens should be prohibited. This list, known as the "Enemy Trading List," was published as a guide and instruction to American merchants in their transactions with foreign countries. It was of a very comprehensive character in that it included not merely firms which were clearly of an enemy character, but neutral firms dealing with such firms or attempting to have commercial relations with the enemy or enemy citizens. It was thus constructed upon the principle of a secondary as well as a primary boycott. The Bureau of Enemy Trade also had charge of the issuance of special licenses to an "enemy" or "ally of enemy" doing business within the United States. In its control over bunkerage, that is, the right of vessels to take on coal for steaming purposes, the United States had another powerful weapon to prevent trading with the enemy or enemy firms. The War Trade Board therefore drew up and promulgated regulations governing this matter in a stringent manner.

Trade with certain countries, such as Holland, Switzerland, and the Scandinavian countries, which were able by their location to maintain trading relations with the enemy, notwithstanding the marine blockade, offered a special problem. Not only could any goods exported from this country to these countries be readily reëxported to the enemy, but if not so reëxported they could be so utilized as to release other commodities for such export to the enemy. To meet this situation the War Trade Board followed the example of Great Britain, and working in close coöperation with that country, negotiated with each of these countries special trade agreements (see also II, *International Relations*).

MOBILIZATION OF SHIPPING

The United States Shipping Board.—Among the absolute essentials for the successful prosecution of the war none took precedence over that of shipping suitable for overseas voyages. Fortunately the need for action looking to the upbuilding of our merchant marine had been appreciated prior to our being drawn into the conflict, and had been met in the Shipping Act of Sept. 7, 1916 (*A. Y. B.*, 1917, p. 522) which created the U. S. Shipping Board.

The Act had two primary ends in view, (1) the provision of an organ that should exercise much the same regulative control over carriers by water engaged in interstate and foreign commerce that was exercised by the Interstate Commerce Commission and the Federal Trade Commission in respect to inland transportation and industrial corporations engaged in interstate business, and (2) the taking of steps that would lead to a restoration of our merchant marine to its former importance. In respect to the latter the Act had specially in mind the construction of vessels that might be used as ordinary merchant vessels in times of peace and as auxiliaries or a reserve to the Navy in time of war. During the war the Shipping Board's regulatory function was practically in abeyance; it was this second function, therefore, that gave the Board its immense importance as a war-time agency.

The U. S. Shipping Board Emergency Fleet Corporation.—The most interesting feature of the Act is probably that which authorized the Board to form, under the laws of the District of Columbia, one or more corporations "for the purchase, equipment, lease, charter, maintenance and operation of merchant vessels in the commerce of the United States." For the acquisition of ships, or the purchase of stock in any corporation created by the Board for this purpose, the Act made a direct appropriation of $50,000,000 and authorized the Secretary of the Treasury, upon the request of the Board and the approval of the President, to sell bonds for this purpose to the amount of another $50,000,000.

In the exercise of the powers thus conferred upon it, the Board on April 16, 1917, organized under the laws of the District of Columbia a corporation, with the maximum permitted capital stock of $50,000,000, under the name of the U. S. Shipping Board Emergency Fleet Corporation. With the exception of qualifying shares of directors all this stock was subscribed for by the Board. To this Corporation the Board delegated the exercise of all of its powers in respect to the acquisition and operation of vessels.

The original powers relative to the acquisition and operation of vessels by the Board were greatly extended by subsequent legislation. By a joint resolution approved May 12, 1917, the President was authorized to take over for the United States the title and ownership of any enemy vessel within the jurisdiction of the United States. This power the President exercised by successive executive orders, with the result that a total of 91 vessels, with an aggregate tonnage of 594,696, belonging to Germany or German citizens, were seized and turned over to the Shipping Board. By provisions contained in the Urgent Deficiencies Appropriation Act of June 15, 1917, the President was given authority not only to take over any ship constructed, under construction, or that might thereafter be constructed, but practically to assume control of the entire shipbuilding resources of the nation. This Act also authorized the expenditure by the President of not to exceed $250,000,000 for the purchase, requisition or acquiring of plants, materials, charters or ships already constructed, or in course of construction, or the expediting of the construction of such ships, exclusive of the cost of ships turned over to the Army and Navy; $500,000,000 for the cost of constructing ships; and $5,000,000 for the operation of ships other than those acquired by the Army and Navy. Of these sums there was appropriated under the first head $150,000,000, under the second head, $250,000,000, and under the third head the full amount of authorized expenditure.

By an act of March 1, 1918, the U. S. Shipping Board Emergency Fleet Corporation was authorized to acquire by purchase, lease or otherwise, land suitable for the construction of houses for the use of employees of shipyards in which ships were being constructed for the United States, to construct thereon houses for such use, to sell, lease or otherwise arrange for the use of these houses by shipyard employees and their families, to acquire by purchase, lease, or otherwise, houses already constructed for such use, and to make loans to persons, firms or corporations for the supply of such housing facilities. With this authorization was given the right to requisition or condemn property for the purpose stated. The sum of $50,000,000 was appropriated to meet the expenses of this work. By act of April 22, 1918, the emergency shipping fund provisions of the Urgency Deficiencies Appropriation Act of June 15, 1917, were amended so as to confer power upon the President to take possession of, lease or assume control of any street railroad, interurban railroad, and all cars, appurtenances and franchises commonly used in connection with the operation thereof necessary for the transfer or transportation of employees of shipyards or plants engaged in the construction of ships or ship equipment for the United States.

Finally, by act of July 18, 1918, the President was given for the period of the war, and for not to exceed nine months thereafter, almost plenary powers over the entire shipping industry of the country from the operation standpoint. This act, taken in connection with those of the Shipping Act and its amendments, in broad terms, authorized the President during the period of the war and for some months thereafter to take over and run the shipping and shipping agencies of the country, almost, if not quite, as completely as he was authorized to take over and run the railroads, telegraphs and telephones of the country, and, short of doing so, to prescribe in the last detail the rates and other conditions that should be observed by such undertakings. The exercise of almost all these powers was vested by the President in the Shipping Board or its subordinate agency, the Emergency Fleet Corporation.

In the foregoing has been given a rapid sketch of the principal steps taken by the Government to provide means by which its shipping needs might be met. It is impossible here to give anything like a detailed account of the vast organization that was built up by the Shipping Board and the Emergency Fleet Corporation for the performance of the manifold activities that they had to engage in. The best that can be done is to give some general idea of the main features of its work, which is supplemented by further accounts in other departments of this and the preceding issue of the YEAR BOOK (see XIX, *The Merchant Marine;* and XX, *Naval Architecture*).

On the construction side the Corporation had immediately to take steps for the extension of existing yards and the construction of new yards. This it did by inducing corporations and individuals to enter the field by promises of orders and the grant of aid in various ways. Of the new shipbuilding plants thus created the most important was that at Hog Island on the Delaware River, constructed and operated by the American International Shipbuilding Corporation for the building of fabricated ships (see XX, *Naval Architecture*). The building of this plant, which is by far the largest shipbuilding plant in the world, gave rise to much criticism on the ground that great extravagance in the expenditure of money occurred, its cost, which was originally estimated at around $22,000,000, running to over $50,000,000, an increase for which no satisfactory explanation is yet available. Acute controversy also arose over the types of ships that should be built, steel, wood, composite, or concrete. Differences regarding this point existed within the Shipping Board as well as outside, and due to it and other causes, there was, in the initial stages, much friction between officials and particularly between those of the Shipping Board and the Emergency Fleet Corporation in regard to their respective jurisdictions and powers. These differences were only finally adjusted by the resignation or dismissal of a number of officers occupying the more important adminstrative positions. With the appointment of Charles M. Schwab as Director-General of the Emergency Fleet Corporation these troubles were apparently finally overcome and the work thereafter was pushed with the utmost energy and dispatch (see also XVIII, *Manufactures*). An indication of the enormous scale of the construction operations of the Emergency Fleet Corporation is contained in the fact that its construction programme, as reported in June, 1918, called for the building of 1,856 ships ranging from 5,000 to 12,000 tons each, and with an aggregate deadweight tonnage of 13,000,000, not including 850,000 tons of barges, composite, concrete, tugs, and other miscellaneous vessels (see also XIX, *The Merchant Marine*).

Construction, however, represented but one of the means by which the Emergency Fleet Corporation secured its vessels. As has been pointed out, the President by executive order transferred to it 91 German ships with an aggregate tonnage of 594,696; these vessels were rapidly repaired and altered to adapt them to the services for which they were needed, many being transferred to the War Department for use as troop transports. Another method of acquiring ships was that of requisitioning ships in process of construction or already in service. Acting under the President's order of July 11, 1917, the Corporation on Aug. 3, 1917, requisitioned all steel ships of over 2,500 deadweight tonnage under construction in American yards. In this way it secured 413 ships in various stages of construction of a total deadweight tonnage of 2,937,808. On Oct. 15, 1917, the Corporation, to secure full control of freight rates and tonnage allotments, requisitioned all power-driven steel cargo vessels and all passenger vessels of 2,500 deadweight tonnage adapted to ocean service (*A. Y. B.*, 1917, p. 507). In large part the operation of requisitioned vessels in service was entrusted to the companies by whom they were formerly controlled; after requisition, however, these vessels were operated under charter from the Corporation. Finally, a large number of vessels, many of recent construction, were brought from the Great Lakes to the Atlantic seaboard. Sixteen of the vessels so transferred were too long to go through the locks in the canals and had to be cut in two for the voyage and afterwards reassembled.

The acquisition of ships by construction, requisition, seizure, charter, or otherwise, constituted but the first phase of the duties of the Emergency Fleet Corporation. It had next to provide for the operation of these vessels. In respect to this it used a number of methods. A considerable number of ships were transferred to the War and Navy Departments for use by them in their operations. Other ships, and particularly those requisitioned while in operation, were chartered to private shipping companies under conditions that permitted the

Corporation to determine their use, to the end that they would be employed only in work essential to the prosecution of the war or the satisfaction of the essential requirements of the American people. A certain number of vessels were transferred to foreign registry, the power to do this having been conferred upon the Shipping Board by the Shipping Act. Finally, the Emergency Fleet Corporation pursued the policy of directly operating many of its vessels. For this purpose it organized a special operating department, the financial operations of which were kept separate and distinct from those relating to construction and other work of the Corporation.

An especially difficult task falling upon the Board was that of securing the officers and men to man its vessels. To a large extent this class of labor was non-existent. On June 1, 1917, a recruiting service was established with offices in the Customs House at Boston, and the work of training deck officers was undertaken. Free Government training schools for merchant marine officers were established at 32 points on the Atlantic and Pacific coasts and the Great Lakes. Eight free engineering schools were established at different places throughout the country for the training of marine engineers, and training ships were also provided for the training of ordinary seamen. The Board had also to devote much attention to the matter of securing labor for the shipyards in which its vessels were being constructed. To handle this work it created an Industrial Service Department, which concerned itself not only with the problem of recruitment of labor in the ordinary sense, but, with the coöperation of the heads of certain international labor unions, with that of industrial education as well (see also XIV, *Vocational Education*).

Shipbuilding Labor Adjustment Board.—Another phase of the labor problem that was of equal importance and of still greater complexity was that of determining the conditions under which labor, when secured, would give its services and of preventing or adjusting disputes with labor regarding such conditions. To meet this problem the Emergency Fleet Corporation, the Navy Department and the American Federation of Labor called to Washington representatives of the leading labor unions having to do with shipbuilding for the purpose of formulating programmes to govern the handling of labor in the shipyards of the country. The outcome of these conferences was the adoption, on Aug. 20, 1917, of an agreement providing for the immediate creation of a body known as the Shipbuilding Labor Adjustment Board with the function of determining labor conditions in the shipyards and adjusting all labor disputes that might arise (*A. Y. B.*, 1917, p. 421). Under the terms of this agreement the President designated V. Everit Macy, president of the National Civic Federation, as his representative and as chairman of the Board. L. A. Coolidge was designated by the Emergency Fleet Corporation as its appointee, and A. J. Berres was similarly designated by Samuel Gompers, acting as president of the American Federation of Labor. F. D. Roosevelt, Assistant Secretary of the Navy, was the representative of the Navy Department when participation on the part of the Navy was necessary.

The execution of this agreement had the immediate result of preventing the outbreak of a strike of all the shipyard employees of the Pacific Coast, and a strike of shipyard employees at New York City, strikes which, if they had occurred, would have been little short of a disaster (*A. Y. B.*, 1917, p. 418). Since its creation the Board has issued a number of orders fixing the wages to be paid shipyard employees and other conditions of labor. Among these mention may be made of its orders fixing wage rates in shipyards on the North Atlantic Coast and the Hudson River, and in shipyards about the Great Lakes (see XV, *Labor*).

National Adjustment Commission.—In the same way as provision had to be made for the determination of labor conditions in shipyards, so it was equally imperative that labor conditions in respect to the loading and discharge of vessels in service should be fixed. To meet this need an agreement was reached early in August, 1917, between the Secretary of War, the Secretary of Labor, the U. S. Shipping Board, Mr. Gompers, representing the American Federation of Labor, the International Longshoremen's Association, and the chief shipping operators for the creation of a National Adjustment Commission which should have the function of fixing the wages and other conditions of labor employed in loading and unloading ships (*A. Y. B.*, 1917, p. 422). This Commission was constituted on Aug. 8, 1917, with R. B. Stevens, vice-chairman of the U. S. Shipping Board as representative of that service and chairman of the Commission, Walter Lippman, assistant to the Secretary of War, as representative of the War Department, T. V. O'Connor of Buffalo, as representative of the Longshoremen's Association, and P. A. S. Franklin, as representative of the Shipping Committee of the Council of National Defense in all cases involving foreign trade, and H. H. Raymon in all cases involving coastwise traffic. In accordance with the terms of the agreement, local adjustment commissions were also created at the most important shipping ports.

Committee on Mariners' Wages.—Still a third class of labor whose terms of employment had to be determined was that of the men engaged in the operation of vessels. In August, 1917, the matters here involved were threshed out at a series of conferences between the Department of Commerce, the Department of Labor, the U. S. Shipping Board, and representatives of the ship owners and operators and mariners' associations of the United States. These conferences resulted in the formation of a committee to represent all parties with power to determine employment conditions for all classes of labor engaged in the operation of vessels constituting the American merchant marine. This committee at once reached an agreement relative to the wages to be paid certain classes of labor. In May, 1918, a large conference, which was designated the National Marine Conference, was held at Washington, at which rules were adopted governing chiefly the wage schedules of marine engineers.

Port and Harbor Facilities Commission.—Still another matter of great importance demanding the attention of the Board was that of increasing the port facilities of the country, and of taking steps for the more effective utilization of such facilities as existed. In a statement given to the public on Sept. 21, 1918, the Board stated that a doubling or trebling of the docks, piers, marine railways and terminal facilities generally of the United States would be required to handle the business of the swiftly increasing American merchant marine. The Board consequently created a Port and Harbors Facilities Commission to consider this whole matter, which at once entered upon a complete inventory of the port facilities of the country. A matter to which it gave special attention was that of the diversion of traffic from one port to another in order to prevent the congestion that was taking place at certain ports, especially at New York. In this work it acted in close coöperation with the Railroad Administration. (See also IX, *Waterways and Harbors.*)

MOBILIZATION OF INLAND TRANSPORTATION AND COMMUNICATION

Importance of the Transportation Problem.—The industry of inland transportation is like that of coal in that it constitutes one of the vital links in our entire industrial system. Any interruption in its proper functioning spells immediate disaster. It was exceedingly unfortunate that our entrance into the war found this link in a condition in which it was ill-fitted to bear the increased strain that was put upon it. For some years past the railroads, due largely to their inability to secure the new capital required, had failed to make their facilities in the form of trackage, terminals, motive power and cars keep pace with the development of the country and the volume of their business. This volume of business was enormously increased by our entrance into the war. The greatest impediment in the way of the railroads meeting this added burden, even in measurable degree, consisted in the fact that they did not constitute a single integrated system of transportation. Not only did they consist of a large number of independent roads, each seeking its own particular interests, but in regard to many important features of their business they were even forbidden by law to act together.

Committee on Transportation and Communication of the Council of National Defense.—Fortunately it was seen at once that this policy must be reversed and the law itself circumvented as far as circumstances would permit. Attempts to meet the situation were made concurrently by the Council of National Defense and the railroads themselves. The Advisory Commission of the Council created a Committee on Transportation and Communication, under the chairmanship of Daniel Willard, president of the Baltimore & Ohio Railroad and a member of the Commission, to concern itself with all matters having to do with the effective utilization of the railroads for war purposes. This Committee immediately took up with the railroads the matter of perfecting their organization so that they would be able to meet the demands of the War Department in respect to the movement of troops and military supplies, for which purpose, at the suggestion of Mr. Willard, the railroads formed four committees to act in conjunction with the commanders of the four military departments.

Railroads War Board.—In testimony before the House Committee on Appropriations on May 23, 1917, Mr. Willard said that that seemed at the time all that was necessary for the railroads to do in the way of coöperating with the Government. It soon became apparent, however, that far more drastic measures would have to be taken if the railroads were to handle with any measurable degree of efficiency the increased business thrown upon them. At his suggestion the Council of National Defense on April 7, 1917, passed a resolution requesting his Committee to call upon the railroads to take such joint action as would result in the most expeditious handling of business. Mr. Willard thereupon wired the presidents of all the important railroads of the country to meet in Washington on April 11. Nearly 50 presidents responded to this call, and all of the important roads of the country were represented directly or by proxy. At this meeting the roads pledged themselves to subordinate their individual interests and to conduct their operations solely with a view to the serving of the public interests.

To put this resolution into effect the American Railway Association created a Special Committee on National Defense (*A. Y. B.*, 1917, p. 529) which in turn created an executive committee of five presidents of leading railroads—Fairfax Harrison, president of the Southern, Samuel Rea, president of the Pennsylvania, Julius Kruttschnitt, chairman of the Executive Committee of the Southern Pacific, Hale Hadden, of the Chicago, Burlington & Quincy, and Howard Elliott, president of the New Haven. Mr. Willard was requested to act with the Committee as an *ex officio* member, and the Interstate Commerce Commission was invited to designate one of its members to act in a like capacity.

This executive committee was popularly known as "the Railroads War Board." It is important to note that, though it worked in close coöperation with the Council of National Defense and by many was mistakenly considered as one of the subordinate units of that organization, it was a committee constituted by and representing the railroads and not the Government. The committee opened headquarters at Washington and organized a large staff, the entire expenses of which were defrayed by the railroads. The members of the Committee gave practically their entire time to the work without remuneration from the Government.

The Railroad Administration.—Though much good was accomplished through these agencies, it became increasingly apparent that the needs of the situation could not be met by them. On Dec. 1, 1917, the Interstate Commerce Commission sent to Congress a special report in which it reviewed the whole situation and pointed out that the only way in which the needs of the Government and the public could be met was by the complete unification of the railroads of the country. Accordingly, by a proclamation dated Dec. 26, 1917, the President announced that he had decided to avail himself of the authority granted him by the Army Appropriation Act of Aug. 29, 1916, and that all of the railroads of the country, with the exception of such branch or private lines as might be specially designated, and the system of water transportation, should be taken over and run by the Government on Dec. 28. This proclamation, in addition to announcing the taking over of the roads, provided for the creation of a Railroad Administration with a Director-General of Railroads at the head, to have entire charge of the operation of the roads taken over, and stated that William G. McAdoo, the Secretary of the Treasury, had been appointed to that office (*A. Y. B.*, 1917, p. 533).

One of the most vital points to be provided for was, of course, that of fixing the financial arrangements that should exist between the Government and the railroads during the time that the roads were in the possession of the Government. In respect to this the President in his statement said: "Investors in railway securities may rest assured that their rights and interests will be as scrupulously looked after as they could be by the directors of the several railway systems." On Jan. 4, 1918, the President delivered a special message to Congress, urging that that body immediately enact legislation that would provide for the protection of the interests of investors in railway securities along the lines laid down in his proclamation and would give to the Railroad Administration the power and funds with which to meet requirements in respect to capital expenditures and the payment of all charges that might not be covered by the earnings of the roads while under the management of the Government. This Congress did by the passage of an act of March 21, 1918, the details of which are summarized elsewhere in this issue, as are also the details of the organization effected by the Railroad Administration (see XIX, *Railroads*).

A feature of this system of Federal administration of national transportation agencies deserving special mention is that it embraced navigable waterways as well as railroads. One of the serious defects in our internal transportation system has been the failure to correlate these two methods of transportation. This failure the Railroad Administration has sought to correct by the development of means of water transportation and providing for their utilization alone or in connection with the railroads. On Feb. 16, 1918, the Director-General appointed an Inland Waterways Committee headed by Gen. W. M. Black to consider the whole problem of the development and more effective utilization of the waterways of the country. On April 11, 1918, the President issued a proclamation taking over the four principal Atlantic coastwise steamship lines and placing their operation under the Railroad Administration. By this act the Railroad Administration was placed in a position where it could route freight either by rail or water as the exigencies of the situation might render advisable. A few days later the Railroad Administration announced its intention of constructing and operating barges on the Erie Canal. On July 22, 1918, the President by proclamation took over and placed under the Railroad Administration the Cape Cod Canal. (See also XIX, *Inland Waterways.*)

Another important act of the Railroad Administration was the consolidation and unification of the express business of the country. In May, 1918, the Director-General authorized the four leading express companies, the Adams, American, Wells-Fargo and Southern, to effect a consolidation under the name of the American Railway Express Co. This done, he entered into a contract with this new Company to handle for the Railroad Administration all of its express business. On Nov. 16, 1918, the President by proclamation took over this company and placed it under the direct administration of the Railroad Administration (see also XIX, *Express Companies*). The Pullman Co. had previously been taken over. The result of these several steps was to bring under a central control practically all of the internal transportation agencies of the country. The ground was thus laid for the correlation and coördination of the work of these several agencies into a general transportation system that could not possibly have been secured while they were under separate management.

Undoubtedly one of the prime considerations leading to the taking over of the railroads by the Government was the critical situation which existed in respect to railway labor. Immediately upon his appointment the Director-General announced that, as the result of a conference with the officers of the railroad brotherhoods, he had appointed a commission, composed of Franklin K. Lane, secretary of the interior, Charles C. McChord, member of the Interstate Commerce Commission, J. Harry Covington, Chief Justice of the Supreme Court of the District of Columbia, and William R. Willcox, formerly chairman of the Public Service Commission for the First District of New York, to investigate and report upon what readjustments should be made, in the wages of railway employees. This Commission made its report on May 10, 1918, and its recommendations, which called for an addition of $350,000,000 to the total payroll of the roads, were adopted with certain modifications by the Railroad Administration and put into effect by an order issued on May 25 (see also XII, *Economic Conditions;* XV, *Labor;* and XIX, *Railroads*).

The order further provided for the creation of a Board of Railway Wages and Working Conditions with the duty of investigating

> matters presented by railway employees or their representatives affecting: (1) inequalities as to wages and working conditions, whether as to individual employees or classes of employees; (2) conditions arising from competition with employees in other industries; (3) rules and working conditions for the several classes of employees, either for the country as a whole or for different parts of the country,

and such other matters affecting wages and working conditions as might be referred to it by the Director-General.

In the meantime the Director-General, by an order issued March 27, created a body known as the Railway Board of Adjustment No. 1, established in pursuance of an agreement entered into by the Director-General with representatives of the four railroad brotherhoods (see XV, *Labor*). This body, of which Charles P. Neill, former U. S. Commissioner of Labor, was made chairman, was intended to settle all disputes that might arise in the establishment of wages, hours and other labor standards otherwise fixed. By an order issued May 31, a similar board known as Railway Board of Adjustment No. 2 was created to perform a similar service in respect to classes of labor covered by an agreement entered into by the Railroad Administration with seven unions representing railroad shop men. E. F. Potter was made chairman of this Board.

It is impossible at this time to measure the results that have been achieved by the Railroad Administration in the accomplishment of the ends for which it was created. In considering this matter it is necessary to distinguish clearly between the results obtained, or to be expected, from the standpoint of the prosecution of the war and from that of giving to the country an improved system of internal transportation. In respect to the first, there can be no question that the policy of the Government in taking over the internal transportation agencies of the country has been fully justified. In respect to the second, there can also be no doubt that conditions have been greatly improved in many respects (see XIX, *Railroads*). Against these advantages, of course, there are certain disadvantages which are not so easy to enumerate. Opinion, however, is almost unanimous that the system should not be allowed wholly to revert to its old uncoördinated condition.

Administration of the Telegraph, Telephone, and Cable Systems by the Post Office Department.—Due largely to the fact that the telegraph, telephone and cable business of the country was already largely centralized in the hands of a few companies, the question of its assumption by the Government did not come up until some time after possession had been taken of the railways. In June, 1918, however, the Government reached the decision that it should have the power to take over this industry, and Congress by a joint resolution approved July 16, 1918, granted to the President the authority to take this action (see *Congress and Administration, supra*). On July 22 the President issued a proclamation directing the taking over by the Government of all of the telegraph and telephone systems of the country and vesting their administration in the Postmaster-General, this action to take effect on Aug. 1. The Postmaster-General, acting for the President, immediately entered upon the work of determining in conference with the officials of the companies the nature of the agreement as regards compensation that should be made with them. In this success was achieved in respect to the American Telephone & Telegraph Co., the Western Union Telegraph Co., and many other subsidiary companies (see XIX, ***Telegraphs and Telephones***). A similar success was not achieved in respect to the Postal Telegraph & Cable Co. An acrimonious dispute between it and the Postmaster-General developed and the former announced that it would appeal to the courts.

The proclamation of July 22 provided for the taking over and operation only of telegraph and telephone lines. On Nov. 2 the President signed another proclamation providing for a similar taking over of all marine cable systems, which was done on Nov. 16. This action, coming after the termination of hostilities, led to much criticism, and still further strained the relations between the Postal Telegraph & Cable Co. and the Post-Office Department (see *Congress and Administration, supra*).

A feature of special interest in this assumption by the Government of the operation of the telegraph, telephone, and cable systems of the country is the fact that such action had long been urged by the present Postmaster-General, as well as by certain of his predecessors in office, as a sound policy irrespective of war conditions. The present Postmaster-General, in other words, is a strong advocate of the Government ownership and operation of these utilities, and will undoubtedly use his utmost effort to have the Government permanently retain them as an integral part of its system of postal administration.

MOBILIZATION OF LABOR

The Labor Problem in War Time.—Scarcely second in importance, for the successful prosecution of the war, to the mobilization of industry was the mobilization of labor. This problem had two phases, that of the determination of labor conditions, and that of the recruitment and direction of labor. The phrase "determination of labor conditions" has been chosen as descriptive of the first phase instead of the more usual expression; "adjustment of labor disputes," since, as the war continued, it became increasingly apparent that the real task confronting the Government was that of determining and enforcing standard basic conditions of labor rather than that of leaving the determination of such conditions in the first instance to the process of bargaining between employers and employees and later stepping in to adjust differences when an agreement between the parties could not be reached. As a result of this appreciation numerous bodies were created by the National Government having for their purpose the determination of labor conditions as well as that of adjusting disputes that might arise notwithstanding efforts in this direction. We examine here those not considered in other connections in this article.

United States Board of Mediation and Conciliation.—Two governmental agencies having for their function the prevention or settlement of industrial disputes were already in existence when the war broke out. The first of these, the U. S. Board of Mediation and Conciliation, was created by the Newlands Act of July 15, 1913, "providing for mediation, conciliation and arbitration in controversies between certain employers and their employees" (*A. Y. B.*, 1913, p. 415). Notwithstanding its general title the Board thus created exercises its functions only in respect to labor disputes between common carriers engaged in interstate commerce and their employees. In respect to these its powers are only those of a mediator or conciliator. It has no power to make a binding award. Prior to the taking over of the railroads by the Government this Board was instrumental in securing the adjustment of a large number of disputes between carriers and their employees.

Division of Conciliation in the Department of Labor.—Though Congress has never made any direct provision for the establishment of a service having as its function the settlement of labor controversies generally, such a service was in effect established by the Department of Labor. This was done under the general powers conferred upon the Secretary of Labor by the Act of March 4, 1913, creating the Department of Labor (*A. Y. B.*, 1913, p. 430). The Secretary of Labor established in his office proper, that is, directly under his control, a service for the adjustment of industrial disputes, to which he gave the name "Division of Conciliation," or at times, "Mediation Service," and the existence of this service has been recognized by Congress through the grant of appropriations for its support. It had no power to issue mandatory orders. Disputants were not even required to accept its good offices. All that the service could do was to seek to bring the parties to disputes together. Notwithstanding its lack of direct authority, however, the Mediation Service has been markedly successful in securing the settlement of a large number of labor disputes, and its existence proved to be of great value in the adjustment of the increased number of labor difficulties growing out of the abnormal conditions resulting from the war (*A. Y. B.*, 1917, p. 421).

Committee on Labor of the Council of National Defense.—Valuable as was the work of these two permanent services of the National Government, they utterly failed to meet the needs of the situation brought about by the war, and numerous other agencies had to be established to handle labor matters. Among these first mention should logically be made of the Committee on Labor of the Advisory Commission of the Council of National Defense.

The importance of labor as one of the dominant factors in the prosecution of the war was recognized by the selection of Samuel Gompers, president of the American Federation of Labor, as one of the six members of the Advisory Commission. Mr. Gompers proved to be an exceptionally energetic and able executive. He immediately grasped the fundamental features of the problems that had to be met if labor was to do its full share in the successful prosecution of the war. These features, briefly epitomized, were:

1. Labor, and especially organized labor, should let it be known in no uncertain tones that it was solidly back of the Government in the prosecution of the war.
2. Both labor and capital should, in effect, declare the war period to be one of truce between them in the sense that no undue advantage would be taken of the abnormal conditions produced by the war to push their respective claims.
3. Labor should interpose no obstacles in the way of the dilution of skilled labor and should refrain from all demands the purpose or effect of which might limit output.
4. Capital on its part should refrain from discriminating against union labor or seeking to discourage its employees from becoming union men, and should see that the pressure of work should not be made a reason for reducing labor standards or the engaging in practices detrimental to the health or welfare of workers.
5. Every effort should be made by both labor and capital to prevent interruptions to work through strikes and lock-outs, and to this end both should agree to the reference of all disputes to properly constituted mediation or arbitration tribunals and to abide by their decisions.
6. If labor was to refrain from taking advantage of the demand for its services to push wages to an excessive height, the Government should take the steps that would ensure that profiteering on the part of capital did not prevail.

There can be no question that the country owes a great debt of gratitude to Mr. Gompers and the leaders of both labor and industry for the loyal way in which they sought to make these principles prevail and the large measure of success that was achieved. It is true that many instances can be cited where excessive wages have been paid and excessive profits secured. Nor can the claim be made that advantage has not, in cases, been taken of the situation by one or the other side to improve its strategic position in reference to the other. On the whole, however, the fundamental end, that of the maintenance of industrial peace during the period of the war, was attained.

At the outset the whole work of determining fundamental policies and of taking the action to secure their adoption fell upon Mr. Gompers' Committee, which was formally constituted on Feb. 13, 1917. The first step taken by Mr. Gompers was to secure, if possible, a general agreement on the part of organized labor as to the attitude that it would take towards the war and the labor problems engendered by it. This was accomplished in a general conference at Washington on March 9, 1917, of the executive officers of all of the leading labor organizations of the United States, who adopted a formal declaration of principles setting forth the attitude of union labor towards the war. In this declaration organized labor pledged its unqualified support of the war and made known its demands. Among these latter were the demands that the Government should take energetic steps to curb profiteering, and that labor should have adequate representation on all bodies created by the Government for the handling of industrial matters.

This meeting of labor was followed by a general conference called by Mr. Gompers, of some 200 representatives of labor, employers' organizations, and others prominent in the field of social reform at Washington on April 2, 1917. This conference effected a permanent organization as the full Committee on Labor of the Council of National Defense. It thereupon organized itself into numerous subcommittees to deal with specific phases of the labor problem, and provided for the creation of an executive committee of 11 members which should act for the whole Committee. This executive committee on April 6, 1917, adopted a formal resolution, the most important provision of which was a recommendation that the Council of National Defense should issue a statement to employers and employees in all industrial establishments and transportation systems, advising that "neither employers nor employees shall endeavor to take advantage of the country's necessities to change existing standards." This was subsequently amplified by the statement that

> it [The Council of National Defense] recognizes that the standard of living is indefinite and difficult to determine, because it is in a measure dependent upon the purchasing power of wages. It believes, however, that no arbitrary change in wages should be sought at this time by either employers or employees through the process of strikes or lockouts without at least giving the established agencies, including those of the several states and of the government and of the Mediation Board in the transportation service and the Division of Concilation of the Department of Labor in the other industries, an opportunity to adjust the difficulties without a stoppage of work occurring.

This securing of a general agreement on the part of labor loyally to support the war and of labor and capital jointly to coöperate and refrain from acts of aggression that might lead to a cessation of work constitutes the great work of this Committee. Of the work done by its several subcommittees, much of which was of great value, it is impossible here to speak. More and more, however, as the war progressed, interest tended to center on other agencies having specific duties in respect to the adjustment of labor conditions.

President's Mediation Commission.—The radical propaganda and disloyal activities of the I. W. W. in the West early gave rise to a very serious situation of affairs (*A. Y. B.*, 1917, p. 419 *et seq.*). The President and his advisers held that a proper meeting of this situation involved an attempt to determine the conditions giving rise to the activities of such an organization and to correct these conditions rather than the application of forcible measures of suppression. In the execution of this policy the President, acting upon a recommendation of the Council of National Defense, created in September, 1917, a commission of five members to make a thorough investigation of the causes of industrial discontent in the mountain regions and on the Pacific Coast, and incidentally to do what it could to secure a settlement of outstanding differences. This Commission, to which was given the name of the

President's Mediation Commission, was constituted as follows: William B. Wilson, Secretary of Labor, chairman, Col. J. L. Spangler, of Pennsylvania, Verner Z. Reed, of Colorado, John H. Walker, of Illinois, and G. P. March, of Washington, members, and Felix Frankfurter, secretary. The Commission proved to be an exceptionally able body. Not only did it settle one important dispute after another, which threatened to disrupt industry in the mountain regions and on the Pacific Coast, but it submitted, on Jan. 9, 1918, a final report that constitutes one of the most important documents bearing upon the problem of labor that this country has produced (see also XV, *Labor*). Nowhere else, it is believed, can there be found in so brief a compass such an acute analysis of the causes of industrial discontent and the steps that should be taken to remove it. Furthermore, the principles of action here laid down constitute the ones which the National Government, acting through its other agencies, has consistently sought to put into execution.

Arsenals and Navy Yards Wage Commission.—The arsenals of the War Department and the navy yards of the Navy Department were direct competitors for many classes of labor. It was manifestly both inequitable and detrimental to efficiency that these two classes of institutions should pay different rates of wages for the same labor or in other respects provide for widely divergent labor conditions. To secure unity of action between the two departments in respect to such matters, the Secretaries of the two Departments, acting in coöperation with the Secretary of Labor, in August, 1917, created a body known as the Arsenals and Navy Yards Wage Commission, which within a month standardized wage scales throughout arsenals and navy yards (*A. Y. B.*, 1917, p. 415). This Commission was composed of Franklin D. Roosevelt, Assistant Secretary of the Navy, Stanley King, Assistant to the Secretary of War, and Rowland B. Mahaney, mediator of the Department of Labor.

Board of Control for Labor Standards in Army Clothing in the War Department.—Among the agencies created by the War Department for the handling of labor matters, special mention should be made of the Board of Control for Labor Standards in Army Clothing. To prevent sweating and to insure that proper working conditions were being observed by all contractors, the Secretary of War, on Aug. 24, 1917, established this Board, composed of Louis Kirstein, of Boston, as chairman, Mrs. Florence Kelley, secretary of the National Consumers' League, of New York, and Capt. Walter G. Kruesi, of the Quartermaster Corps, U. S. R., to prescribe the labor conditions to be observed by all contractors for the supply of Army clothing (*A. Y. B.*, 1917, p. 415). On Jan. 24, 1918, the Secretary of War was able to announce that the work for which the Board had been created was so largely completed that it was unnecessary to continue it longer. The Board was accordingly abolished, and the enforcement of the standards prescribed by the Board was turned over to the Industrial Relations Division of the Quartermaster-General's Office.

The Secretary of Labor as Labor Administrator.—Notwithstanding the value of the work performed by these several agencies, together with those described in connection with the Shipping Board and the Railroad and Fuel Administrations, it became increasingly apparent as the war progressed that these agencies, acting individually and independently, could not meet the conditions of labor employment brought about by the war. So long as each branch of administration had its board or division for the adjustment of labor disputes and the determination of labor conditions, it was inevitable that wide variations would exist in respect to wages, hours of labor, etc., recommended or ordered by them. The only solution to this situation lay in the creation of some central agency which should either take over the work of these several agencies or act as a superior authority to determine the fundamental principles that should be followed by them in reaching their determinations. Both the President's Mediation Commission and the Council of National Defense pointed out the need for a unification of the labor-controlling agencies of the Government. As the result of a series of conferences relative to labor conditions and problems, the latter body, early in January, 1918, submitted to the President a programme for the organization of a central labor administration to handle all matters relating to labor in war work. This programme was immediately approved by the President, and as a first step towards its execution he, by executive order issued Jan. 4, designated the Secretary of Labor as Labor Administrator with the duty of taking the action that would establish a general direction and control over the work of the Government in the labor field. Later, in May, 1918, Felix Frankfurter was appointed by the Secretary of Labor to act as, in effect, Assistant Labor Administrator.

Advisory Council of the Labor Administration.—The next step in carrying out this programme was the appointment by the Secretary of Labor, acting as Labor Administrator, on Jan. 16, 1918, of an Advisory Council composed of John Lind, chairman, representative of the General public; Waddill Catchins, chairman of the War Committee of the Chamber of Commerce of the United States, and A. A. London, vice-chairman of the Aircraft Board of the Council of National Defense, as representatives of employers; John B. Lennon, treasurer of the American Federation of Labor, and John J. Casey, former member of Congress, as representatives of employees; Prof. L. C. Marshall, professor of economics in Chicago University, as representative of economists; and Miss Agnes Nestor, as representative of women in industry. In a statement published in the *Official Bulletin* of the same date, announcing the appointment of this Council, it was stated that:

> The Labor Administrator and his Advisory Council will at once take in hand the questions of standardization of labor policies; the providing, distributing, and maintaining of a stable and adequate supply of workers; labor dilution and training, priority demands, the adjustment of disputes, and the safeguarding of employment, living, and housing conditions. The Advisory Council will study all phases of the problems, make recommendations and plans for additional machinery and supervise their execution.

War Labor Conference Board.—Appreciation was had by the Secretary of Labor that if the labor policies to be adopted by the Government and the administration to be created for their formulation and execution were to be effective, they must have the united approval and support of both employers and employees. To this end the Secretary on Jan. 28, 1918, provided for the creation of a body known as the War Labor Conference Board to consist of representatives of both employers and employees to assist him in the formulation of a labor programme. This Board as the result of its deliberations formulated a programme of action which it submitted to the Secretary of Labor in the form of a letter dated March 29, 1918. This letter is a document of great importance since it sets forth the fundamental programme that was adopted by the President for the handling of labor matters during the war.

National War Labor Board.—One of the most important recommendations contained in this report was that there should be created a National War Labor Board, with the same number of members, to be selected by the same agencies that created the War Labor Conference Board, with the function of adjusting labor disputes in the manner and in accordance with the conditions set forth in its report (see XV, *Labor*). This recommendation was at once acted upon by the Secretary of Labor, which action was approved and confirmed by the President, through the issue of a proclamation of April 8, 1918. In this proclamation, which gave to the Board the same membership as the War Labor Conference Board, the President stated that:

> The powers, functions, and duties of the National War Labor Board shall be: To settle by mediation and conciliation controversies arising between employers and workers in fields of production necessary for the effective conduct of the war, or in other fields of national activity, delays and obstructions which might, in the opinion of the National Board, affect detrimentally such production; to provide, by direct appointment or otherwise, for committees or boards to sit in various parts of the country where controversies arise and secure settlement by local mediation and conciliation; and to summon the parties to controversies

for hearing and action by the National Board in event of failure to secure settlement by mediation and conciliation.

The principles to be observed and the methods to be followed by the National Board in exercising such powers and functions and performing such duties shall be those specified in the said report of the War Labor Conference Board dated March 29, 1918, a complete copy of which is hereunto appended.

The national board shall refuse to take cognizance of a controversy between employer and workers in any field of industrial or other activity where there is by agreement or Federal law a means of settlement which has not been invoked.

The National War Labor Board at once organized and began operations. On May 10, 1918, announcement was made that W. Jett Lauck, a prominent student and investigator of labor problems, had been appointed executive secretary of the Board; its joint chairmen were William H. Taft and Frank P. Walsh. The Board has been called upon to adjust a number of very important labor disputes (see XV, *Labor*). In all cases but that of the Western Union Telegraph Co., the award of the Board was accepted by the parties involved. The Western Union controversy was subsequently adjusted after the Government took over the operation of the telegraph and telephone systems of the country (see XV, *Labor*).

War Labor Policies Board.—The National War Labor Board, as organized, was an administrative body, the chief function of which was to secure the adjustment of labor differences that threatened or actually broke out. To supplement the work of this body the need was felt for another body that, free from all administrative responsibility, could devote itself to the consideration of all the various labor problems confronting the Government and the formulation of the policies that should be followed by the National War Labor Board and other administrative agencies in meeting them. To meet this need, announcement was made in the *Official Bulletin* of May 17, 1918, that a new body would be created, to be known as the War Labor Policies Board, and on June 8, 1918, the further announcement was made that this Board had been constituted with the following membership: Felix Frankfurter, chairman of the Board; Stanley King, Assistant to the Secretary of War; Franklin D. Roosevelt, Assistant Secretary of the Navy; G. I. Christie, Assistant to the Secretary of Agriculture; Hugh Frayne, chairman of the Labor Division of the War Industries Board; John P. White, labor representative of the Fuel Administration; R. P. Bass, in charge of labor matters, U. S. Shipping Board; Howard Coonley, vice-president, or Charles Piez, former general manager, of the Emergency Fleet Corporation; and representatives of the Food and Railroad Administrations to be afterwards designated. It will be seen that the theory on which this Board was constituted was to have represented on it all branches of the Government service that were large employers of labor and in each case to have as representative the officer exercising chief responsibility for the determination of labor policies and conditions for the service represented.

The first results of the work of the Board of a constructive character were embodied in a resolution, a copy of which was published in the *Official Bulletin* of July 17, 1918, setting forth at length the standards and conditions of employment that should be observed by all Government agencies in the employment of women in war industries (see XV, *Labor*). The most difficult problem confronting the Board was that of standardizing, as far as feasible, wages and hours of labor in the various industries throughout the country. This standardization was urgently needed as constituting the essential basis for controlling the excessive turnover of labor due to employees shifting from one job to another as more advantageous conditions were offered by employers in competing for labor. It does not appear that this ambitious programme of the Board was ever put into execution. Had the war continued longer, however, it is quite possible that the country would have been presented with a system of wage fixing by the Government analogous in all essential respects to that of price fixing as practiced by the War Industries Board and other war agencies.

United States Employment Service of the Department of Labor.—The second phase of the war-labor problem was that of the recruitment of labor and its direction into the channels where it was most needed. Recruitment work analogous to that of the Shipping Board (see *supra*), though on a somewhat more restricted scale, had to be done by other agencies. These efforts had for their purpose to meet the needs of specific agencies of the Government. There was, however, a much broader need for a general recruitment service that would mobilize the labor of the country generally for industrial purposes. To meet this need there was established under the Department of Labor a general recruitment service, under the name of the U. S. Employment Service.

For some years prior to the outbreak of the war, the Department of Labor had an Employment Service to assist employers in securing labor and laborers out of employment in securing employment, mainly through the agency of a system of labor exchanges covering the entire country (see XIV, *Unemployment*). Arrangements were also made with the Post Office Department by which all of the post offices were utilized practically as branch offices. The Employment Service likewise established coöperative relations with all state and municipal employment bureaus and sought to make of itself an agency for coördinating the work of these establishments.

In addition to operating a general employment agency, this Service undertook a number of special activities having for their purpose the mobilization of labor for war purposes. In May, 1917, it created the Boys' Working Reserve, and in the following month Public Service Reserve (see XIV, *Unemployment*). In the spring of 1918 it organized a Farm Service Division to coöperate with the Department of Agriculture in the recruitment and placement of farm laborers (see also XVI, *Agriculture*). A few months later, in June, 1918, it created a special Division of Stevedores and Marine Workers to act as the exclusive agency for the recruitment of stevedores, marine workers, and longshoremen in every port in the United States. It created also a Women's Division, to concern itself specially with the recruitment of women workers for war purposes, and it coöperated with the Shipping Board in the latter's efforts to secure men for their plants (see also XIV, *Vocational Education*).

Up to the middle of 1918 the operations of this Service were on a purely voluntary basis. No employer or employee was under compulsion to make use of its services unless he cared to do so. As the demand for labor increased, the evils of different branches of the Government and different private plants engaged upon war work competing for labor with the result of an enormous labor turnover and constantly rising wages became more and more manifest. It became evident that some action had to be taken by the Government to meet this situation analogous to that taken through the War Industries Board to stabilize prices and determine priorities in the supply of materials, production, and disposition of commodities. This question was one of the first to receive the attention of the War Labor Policies Board. The result of its consideration of this question was the passage on June 15, 1918, of a resolution expressing the opinion that all recruiting of industrial labor for public or private work connected with the war should be conducted through or in accordance with methods authorized by the U. S. Employment Service; that this programme should be inaugurated on Aug. 1 as regards unskilled labor and be extended to other classes of labor as rapidly as circumstances permitted; and that the Labor Policies Board should appoint a Labor Priorities Committee that would determine where available labor should go. The President adopted this recommendation contained in this letter and on June 17, 1918, issued to the public a statement in which he solemnly urged all employers engaged in war work to refrain after Aug. 1 from recruiting unskilled labor except through the U. S. Employment Service, and all labor to respond loyally to any calls issued by that agency for voluntary enlistment in essential industries. It will be noted that this statement was not in the form of an executive order or proclamation and thus legally constituted only an appeal to employers and employees to follow the programme to which it referred. The Service at once elaborated detailed instructions for the guidance of employers (see XIV, *Unemployment*) and at the termination of hostilities the new system of labor control and priorities was in active operation, but its experience was too slight to demonstrate the extent to which it was adapted to meet the needs of the situation.

Bureau of Industrial Housing and Transportation of the Department of Labor.—A phase of the labor situation brought about by the war the importance of which was not immediately appreciated was that of the housing of the workmen and their families who were assembled at the new or enlarged plants for the manufacture of war supplies. Under normal conditions dependence might have been placed on private initiative for meeting the need for increased housing facilities, but under the existing conditions not only was there a failure on the part of private capital to enter the field but there was little or no hope that it could be induced to do so. The situation in many places became steadily worse. Not only were living conditions bad, but the actual prosecution of the war work was seriously jeopardized through the refusal of employees, and especially those belonging to the skilled grades of labor, to remain at plants where they could not secure proper housing accommodations for themselves and their families at reasonable rates.

By the spring of 1918 it became evident that the situation could only be met by the National Government itself providing the funds with which to build the houses needed and of taking the steps to see that such houses were built. Congress was appealed to, and on May 16, 1918, passed an act authorizing the President to expend not in excess of $60,000,000 for this work, of which sum $10,000,000 was to be for the purpose of providing housing accommodations for war workers at Washington. This act was supplemented by provisions contained in the Urgent Deficiencies Act of June 4, 1918, which not only appropriated the $60,000,000, the expenditure of which had been authorized, but empowered the President to create for the purpose of carrying out the work authorized a corporation or corporations and directed that the appropriation should be deemed to be a revolving fund until June 30, 1919. Subsequent legislation appropriated an additional sum of $40,000,000, thus raising the total available to $100,000,000, not including the $50,000,000, which, as has been shown, was granted to the U. S. Shipping Board to enable it to provide housing accommodations for workers at shipbuilding plants.

Acting under the authority conferred upon him by the Overman Act, the President, by executive order of June 18, 1918, vested the expenditure of this sum and the doing of all things called for by the Housing Act in the Secretary of Labor. The latter created for this purpose a special service under the name of the Bureau of Industrial Housing and Transportation, and appointed Otto M. Eidlitz as its chief.

United States Housing Corporation.—The Bureau of Industrial Housing and Transportation had general responsibility for the working out of a housing and transportation programme for war workers. The actual work of constructing and operating houses was entrusted to a U. S. Housing Corporation specially incorporated by it for the performance of this work. Plans were prepared and work was begun on the erection of houses at numerous places where the need for additional accommodations were most urgent, but in few or no cases had this work been completed when the armistice was signed. (See also VI, *Housing*.)

MOBILIZATION OF FOOD PRODUCTS

Food Problems and Control Policy.—The necessity for the assumption by the Government of direction and control over the production, distribution and consumption of food products arose from two major causes, (1) the imperative need on the part of our allies and neutrals for a much larger quantity of food and feed stuffs than we were accustomed to send them, and (2) the protection of our own public from the evils of excessive prices, profiteering, hoarding and other inevitable consequences of a condition where demand far outran supply.

In taking action upon this matter it was of prime importance that the United States should adopt a consistent policy. In respect to this the important decision was made to avoid the legal rationing system adopted by European countries and to place the main dependence on voluntary co-operation on the part of the various branches of the food trade and the consuming public for the carrying out of such regulations as the Food Administration might promulgate. In thus declaring against anything like a compulsory rationing of the population or even the fixing of prices generally, it was nevertheless recognized that legislation was desirable having for its purpose to prohibit during the war certain acts and to confer upon the Government enlarged powers to carry out its determinations in respect to food control and coerce the minority who might be unwilling loyally to comply with the Government's plan. Such legislation was secured by the passage of two acts, both approved Aug. 10, 1917, and entitled, respectively, "An Act to provide further for the national security and defense by stimulating agriculture and facilitating the distribution of agricultural products," and "An Act to provide further for the national security and defense by encouraging the production, conserving the supply and controlling the distribution of food products and fuel."

The first of these Acts had for its special purpose the enlargement of the powers of the Department of Agriculture and the grant to it of increased appropriations with which to carry on its work (*A. Y. B.*, 1917, p. 436). The second, known as the Food and Fuel Control Act, or the Lever Act, from the name of its author, was a much more important and radical measure. It had for its purpose to provide for the establishment of a system of rigid governmental control over almost all the processes involved in the production, distribution and consumption of a large number of so-called necessaries, the most important of which were foodstuffs, feeds, fertilizers, farm machinery, coal, and other fuels, and all industries such as stockyards, elevators, etc., serving these economic interests, and the authorizing of the President to create such agencies and issue such orders and regulations as he deemed desirable for carrying into effect the purposes of the Act (*A. Y. B.*, 1917, p. 13).

U. S. Food Administration.—The most significant feature of the Act from the standpoint of adminstration is that it made no attempt itself to set up an administrative machinery for the enforcement of its provisions, but vested full authority in the President to take such action in this respect as he saw fit. On the same day that this Act became a law, Aug. 10, 1917, the President issued an executive order creating an independent service for the administration of those features of the law having to do with food products and related industries under the name of the United States Food Administration, and designated Herbert Hoover as its head, with the title of United States Food Administrator. Though it was not until August 10, 1917, that the Food Administration was established on a definite legal basis, Mr. Hoover, as early as May 19, 1917, had been requested by the President to act as Food Administrator for the purpose of doing what he could under then existing laws to mobilize the food resources and potentialities of the country for war purposes.

Though the Food and Fuel Control Act gave him powers of the most drastic character, Mr. Hoover continued to perform his duties as far as possible in accordance with the voluntary principles above described. The keynote of his administration was that of making an appeal to the patriotism of the farmers and the consuming public voluntarily to do each his part in carrying out a food production and conservation programme as worked out by the Food Administration, and of bringing into play the compulsory features of the law only after all other efforts had failed. This programme of the Food Administration involved a number of activities which, for purposes of consideration at least, can be fairly well distinguished.

Among these activities first mention should logically be made of stimulating production. Responsibility for the securing of this fell primarily upon the Department of Agriculture. The Food Administration, however, was able to second the efforts of that organization in many ways. Especially were efforts made through the use of varied means of propaganda to encourage the utilization of all land available for cultivation, the planting of small gardens, and the selection for planting of those crops of which there was the greatest need (see XVI, *Agriculture*, in *A. Y. B.*, 1917 and 1918).

A second activity complementary to this and directly within the province of the Food Administration was that of conservation or economy in the consumption of food products. This meant the organization and conduct of a great campaign of public education. The Food Administration distributed broadcast a vast amount of literature, carefuly prepared by the highest experts in the country giving specific instructions in respect to diet, food substitutes, food economy, and scores of other analogous features having to do with the consumption and conservation of food products. There can be no question as to the effectiveness of this work. There were probably few families which did not do something in the way of responding to the appeals of the Food Administration and many did a great deal. Especially did the hotels, restaurants and other public eating places respond loyally to the appeal made to them.

Although it was the desire of the Food Administration to rely as far as possible upon this method of securing economy in the consumption of food products, the situation in respect to certain commodities, of which wheat and flour were the most important, became such that recourse had finally to be had to measures of a more stringent character. Millers thus were required to convert a larger part of the wheat berry into flour than had been their practice in the past. They or bakers were required to mix with this flour a certain percentage of other classes of flour, such as rye, cornmeal, potato meal, etc. Finally, a modified form of rationing had to be introduced, through the issue and enforcement of regulations prohibiting the sale of more than a certain quantity of wheat flour or of sugar at one time, or more than a certain quantity per week to the same family. Such a limitation of consumption, however, was far different from that enforced in other countries through the use of rationing cards for most important commodities.

Though much could be, and was, done in the way of increasing production, on the one hand, and restraining consumption, on the other, the fact still remained that the supply of certain classes of food products was inadequate to meet all demands. This being so, it became necessary for the Food Administration to take action that would prevent the prices of these articles being run up to excessive figures and insure that the supply that was available was properly distributed. The basis for a system of control that would accomplish these purposes was laid in the establishment of a licensing system that was gradually extended until it included almost all classes of dealers and agents handling food products. In accordance with the provisions of the law this system was established through proclamations issued by the President.

The purpose and effect of this licensing system was to subject all of the lines of business covered by it to such regulations as the Food Administration might from time to time establish, since no person was granted a license who did not agree to abide by such regulations, and thereafter such regulations could be enforced by threatening to cancel or cancelling the license of a licensee failing to observe such regulations. In practice many offending firms were given the alternative of paying fines, making contributions of a fixed amount to some war purpose, or of shutting down for a given number of days or weeks or having their licenses cancelled.

An important feature of this licensing system was the establishment, through the rules and regulations governing the issue of licenses, of a control over profits. Though no power was granted to the President, except in the case of wheat (see *infra*) to fix prices directly, he was given authority to prevent the making of excessive profits and thus indirectly to regulate prices. The exercise of this power the President by executive order of Nov. 27, 1917, vested in the Food Administrator. The Food Administration, however, came pretty close to fixing the price of food products to consumers through the inauguration in June, 1918, of a plan by which standardized "fair price lists" were to be periodically prepared by local boards or committees composed of representatives of the wholesalers, retailers and consumers in each community, which lists were to be posted up by all dealers where they could be easily seen by their customers. This system worked with great efficiency. It did not keep down rising prices, but it did insure equality of treatment of dealers and consumers and undoubtedly prevented excessive charges and profits by unscrupulous dealers inclined to make all the profit they could out of the public's needs.

In controlling the distribution of food products the Food Administration had to consider not only needs in this country but in other countries as well. The actual licensing of food imports and exports was a function of the War Trade Board (see *supra*). That body, however, acted in close coöperation with the Food Administration and almost wholly on its advice. Contact with the War Trade Board was secured through the representation that the Food Administration had on that Board.

Another special duty of the Food Administration was that of the coordination of the purchases of food products by the Army and Navy, the Red Cross, the Belgian Relief and the Allies. Under the contracts between the United States Treasury and the Allies all food purchases had to be made with the approval of or by the United States. This control was delegated to the Food Administration. All grains were purchased for the Allies by the Food Administration Grain Corporation (see *infra*). All other food purchases for the Allies were made through the Division of Coördination of Purchases.

By executive order of Oct. 28, 1917, the Food Administrator was authorized by the President to exercise the power vested in him to requisition any and all foods and feeds and storage facilities for the same that he might deem necessary for any public use connected with the common defense, other than the support of the Army or Navy, and to ascertain and pay just compensation therefor. The possession of this power was of value to the Food Administrator, but it does not appear that actual use was made of the authority to any important extent.

So acute was the situation as regards the supply of wheat at the time the Food and Fuel Control Act was passed (*A. Y. B.*, 1917, p. 439) that Congress wrote into the Act provisions conferring extraordinary powers upon the President to promote the production and to control the distribution of this article. He was thus empowered to fix a guaranteed price of wheat to growers of wheat, in order to stimulate them to the utmost efforts in the production of wheat, and to purchase, store, and sell wheat, flour and meal, as well as beans and potatoes, in addition to the other things which he was authorized to do in respect to food products generally. On Aug. 30, 1917, the President announced that he had fixed a basic price of $2.20 a bushel for standard wheat at Chicago, the prices of other grades and at other markets being adjusted to this basic price. On Feb. 25, 1918, the President announced that this price had been continued for the 1918 harvest with no essential alteration, and a similar announcement was made on Sept. 2, 1918, in respect to the 1919 wheat harvest.

Food Administration Grain Corporation.—A prime factor in the wheat situation was that the Food Administration, acting as the agent of the Government for the securing of wheat and wheat flour for itself for use by the Army and Navy and for meeting the needs of the Allies, was so large a purchaser as completely to dominate the market. The Food Administration, in order to meet the situation thereby engendered, was compelled to enter the business of purchasing, storing, distributing, and selling of wheat and wheat flour. Following the example of the U. S. Shipping Board in the creation of the Emergency Fleet Corporation, the Food Administration decided to create a special corporation for the performance of this activity.

On Aug. 14, 1917, the President accordingly issued an executive order directing the organization of a Corporation, under the laws of the State of Delaware, to be known as the Food Administration Grain Corporation, to engage in this work of buying, storing, transporting and selling of grain. On the same day the incorporation of this company was effected. The capital stock of the Corporation was fixed at $50,000,000, divided into 500,000 shares of the par value of $100 each, and the Food Administration was authorized and directed to subscribe for all of this stock, and to pay for the same out of the appropriation of $150,000,000 provided for by the Food and Fuel Control Act. On June 21, 1918, a further executive order was issued by the President increasing the capital stock of the Grain Corporation to $150,000,000, and directing the Food Administration to purchase on behalf of the Government such amount of such capital stock as was needed to supply the capital required by the Corporation for carrying on its operations. This order further directed the Corporation to offer, or to stand ready, to purchase at the guaranteed price all wheat tendered to it, and authorized the Corporation to borrow such sums of money upon the security of the wheat or flour owned by it as might be necessary to meet its financial needs. Later, on July 5, 1918, the Food Administration announced that it would extend its operations of purchase, storage and sale of all classes of cereals and that for this purpose it had created a Cereal Division to have general charge over this work. This Division would continue, however, to make use of the Grain Corporation as its agent for the handling of all the financial transactions involved. (See also XVI, *Agriculture.*)

MOBILIZATION OF FUEL

The Fuel Problem.—The necessity for the immediate assumption by the Government of control over the production, distribution and consumption of coal and other fuel was, if anything, even more imperative then in the case of food. After our entrance into the war everything conspired to make the coal situation a difficult one. The demand for coal was enormously increased to meet the requirements of the new munitions factories and the increased activities of the railroads and shipping. The railroads did not have an adequate number of cars and locomotives to meet the demand thrown upon them, and such as they had they could not use effectively through the congestion that took place at eastern ports and other terminals. Labor was difficult to get, due to the draft that had been made on the available supply for the recruitment of the Army and Navy and the personnel of the shipyards and munition plants. On top of this came one of the severest winters the country has ever experienced. Excessive cold and snow not only called for a larger consumption of coal for heating and steaming purposes but hampered greatly the ability of the railroads to handle their trains. The situation was thus one of extreme gravity and tended steadily to become worse. The whole question of coal supply was like a chain, the breakage of a single link of which meant disaster. It could not possibly adjust itself. With an inadequate supply prices tended to soar, and there was no assurance that the industries most in need of fuel would get it unless the industry was subjected to rigid control.

Committee on Coal Production of the Council of National Defense.—An attempt to handle this situation was first made by the Council of National Defense, which, early in May, 1917, appointed a Committee on Coal Production with Francis S. Peabody as Chairman. This Committee at a conference with coal operators held at Washington June 28, 1917, at which members of the Council of National Defense and the Federal Trade Commission were present, reached an agreement fixing the price at which bituminous coal would be furnished at $3 a ton. This agreement was immediately repudiated by the Secretary of War, who, as president of the Council of National Defense, wrote under date of June 30, 1917, a letter to the director of the Council calling attention to the fact that the Council of National Defense was a purely advisory body and as such had no power to fix prices or perform any other act of an administrative character, and stating that in his opinion the price agreed upon was "exorbitant, unjust and oppressive."

United States Fuel Administration.—This difference between members of the administration attracted considerable attention and served to emphasize the need for some organ which could have positive powers not only to fix prices but to take the other action required to meet a situation that was constantly growing more acute. Provision for the creation of such an organ and the exercise of such powers was made by the Food and Fuel Control Act of Aug. 10, 1917. This Act provided for the exercise by the Government of powers of control over the production, distribution and consumption of coal and other fuels that were even more drastic than in the case of food products. All the powers conferred upon the President to license food industries, requisition food supplies, purchase, store and sell food products, issue regulations to prevent the charging of excessive prices and speculation in food articles, take over and operate plants for the manufacture or handling of food products, etc., which have been enumerated in our account of the Food Administration were likewise granted to the President in respect to fuels. In addition he was expressly authorized, whenever in his judgment the efficient prosecution of the war required it, "to fix the price of coal and coke wherever and whenever sold, either by producer or dealer, to establish rules for the regulation of and to regulate the method of production, sale, shipment, distribution, apportionment or storage thereof among dealers and consumers, domestic or foreign." In case of failure by any producer or dealer to conform to any such regulation he was authorized to take over the plant or business of such person and operate it. In broad terms the Government was thus given practically plenary powers over the whole industry of the production, distribution and consumption of coal and coke even to the extent, if necessary, of taking over such industry and operating it as a Government undertaking.

A few days after the passage of this act the President, by executive order dated Aug. 23, 1917, created the United States Fuel Administration, and designated Harry A. Garfield, then president of William College, as its head, with the title of United States Fuel Administrator. An analysis of the functions of the Fuel Administration shows that it had to concern itself with the following matters: (1) the stimulation of production; (2) the adjustment of disputes between mine operators and their employees; (3) the fixing of prices; (4) the control of distribution and apportionment; and (5) the taking of steps to secure economy in consumption. In all five of these fields the Fuel Administration was extremely active.

In respect to the first, constant appeals were made to operators and miners to increase their output; the opening of new mines was encouraged, and every effort made to have operators adopt the best devices and means for efficiency in operation. In regard to the second, the Fuel Administrator appointed on his staff a representative of the operators and the miners with the duty of advising him in regard to all labor matters and of taking the action required to adjust all disputes that might arise. Especial efforts were of course made to avoid strikes. The most important step taken in this field was the securing of an agreement between the operators and the United Mine Workers of America that each wage agreement should have written into it a penalty clause by which both parties agreed, subject to the imposition of a penalty, not to interrupt operations pending any examination of questions involving the fixing of prices and wages. This clause having been adopted by the two parties, was made a condition of the wage increases provided for in the President's order of Oct. 27, 1917 (*A. Y. B.*, 1917, p. 420). Finally, in August, 1918, a general agreement was reached between the Fuel Administrator, the mine operators and the miners in respect to the principles that should govern in the adjustment of all disputes arising between mine operators and their employees (see XV, *Labor*).

The power to fix prices has been fully exercised by the Fuel Administrator with the result that the price of coal at all stages of its handling, at the mine, in the hands of jobbers, and as charged by retailers, has been determined by order. Scarcely less in importance and of still greater urgency was the task of the Fuel Adminstration of regulating the distribution of the inadequate supply of coal available so that it would go where it was most needed. In seeking to solve the problem of the allotment or distribution of coal geographically, the most important step taken by the Fuel Administration was that of working out, in conjunction with the Railroad Administration, of a system under which the whole country was divided into coal zones and districts. The purpose of this system was to eliminate the waste in labor and use of cars resulting from what is known as cross hauls.

As the winter of 1917-18 advanced, it became increasingly apparent that serious difficulties were going to be encountered in furnishing to domestic consumers even the minimum amount of coal required by them to heat their residences and the many small shops and stores to heat their buildings. This situation was one that could only be met by the Government assuming almost entire charge of the distribution of coal to these consumers. The Fuel Administration therefore issued order after order directing the movement of coal as the need for coal in one locality or another became apparent. By an order issued March 9, 1918, and becoming effective April 1, following, the Fuel Administration established what was in effect a rationing system for domestic consumers. A few days later, on March 15, 1918, the President issued a proclamation establishing a general licensing system to be administered by the Fuel Administration for practically all persons, firms, and corporations "engaged in the business of distributing coal or coke as jobber, trader, selling agent, purchasing agent, wholesaler, or in any capacity whatsoever."

The fifth branch of the activities of the Fuel Administration consisted in the taking of steps to secure economy and efficiency in the consumption of coal. With the coöperation of the Bureau of Mines a campaign of education was carried on, having for its purpose to inform coal users how best to feed and stoke their furnaces to secure the maximum result with the minimum use of fuel. The use of wood in substitution of coal was encouraged. On Nov. 9, 1917, an order was issued prohibiting the use of coal for purposes of generating electricity for use in operating illuminated advertisements, notices, signs, etc., between the hours of 7.45 and 11 p. m. This was followed by the excessively drastic order of Jan. 17, 1918, which provided that on the following five days and on every Monday beginning with Jan. 28 to March 25, 1918, inclusive, practically all industries should be virtually shut down (*A. Y. B.*, 1917, p. 28). This order applied only to the region east of the Mississippi River and including the whole of Louisiana and Minnesota. It is unnecessary to say that this order excited much comment in respect to its necessity. It was, however, generally and loyally observed. The reason for its issuance was not wholly that of the absolute shortage of coal. Primarily it was issued to break the blockade of cars on the railroads and to permit of the sailing of vessels so as to relieve the congestion in the eastern ports and to give to our Allies the products of which they were urgently in need.

At the outset the activities of the Fuel Administration were devoted almost wholly to the matter of the production, distribution and consumption of coal. On Jan. 31, 1918, control over the distribution of fuel oil was established by the President issuing a proclamation establishing a licensing system under the administration of the Fuel Administration for all producers and dealers in fuel oil whose annual gross sales amounted to more than 100,000 bbl. This was followed by an order of the Fuel Administration of the same date fixing priority in respect to the securing of fuel oil. On Aug. 7, 1918, the President, acting under the power conferred upon him by the Overman Act, transferred to the Fuel Administration the duty of preparing and adopting standardized specifications for the supply of petroleum and its products to all Government departments and agencies, and for this purpose directed the creation of a committee representing the more important war agencies and Bureaus of Mines and Standards for the preparation of such specifications. A final step in bringing under Government control practically all classes of fuel except wood was taken through the issue, on Sept. 16, 1918, of a proclamation requiring the licensing by the Fuel Administration of all importers, producers, manufacturers, transporters (except those specifically exempted by the Food and Fuel Control Act) and all retailers (except those whose sales did not amount to $100,000 a year) of crude oil, fuel oil, gas oil, kerosene, gasoline, and natural gas. The Fuel Administrator was at the same time authorized to establish and enforce such regulations in respect to the issuance or cancellation of such licenses as in his opinion were necessary to carry into effect the purposes of the Food and Fuel Control Act.

CONTROL OF ENEMY ALIENS AND SUPPORTERS

Espionage and Sedition.—One of the special problems that had to be met by the United States in the prosecution of the war arose through the residence within our midst of large numbers of enemy aliens or sympathizers, many of whom, it was apparent, were prepared to go to almost any length in the way of promoting the interests of the enemy and injuring those of the country whose hospitality they enjoyed. To meet this situation the most stringent measures of precaution had to be taken and the powers of the Government greatly enlarged by appropriate legislation. Among the laws thus enacted the most important were the Espionage Act of June 15, 1917 (*A. Y. B.*, 1917, p. 12), the amendment to that act of May 6, 1918 (see *Congress and Administration, supra*), the Trading with the Enemy Act of Oct. 2, 1917, and the Sabotage Act of April 20, 1918 (see *Congress and Administration, supra*).

It is unnecessary here to attempt an account of all the action taken by the Government under these Acts to restrain the activities of enemy aliens and sympathizers, the salient features of which have been covered elsewhere in this and the preceding issue of the YEAR BOOK. Such action, however, may be enumerated under the following heads: the control of utterances or publications of a treasonable or seditious character or of a nature calculated to give aid and comfort to the enemy or to embarrass the Government in its war activities; the prohibition or control of trading with the enemy, enemy sympathizers or persons having trading relations with the enemy; the control of the entry or departure of enemy aliens from the United States; the registration of alien enemies; the fixing of zones or districts within which enemy aliens should not reside or enter; the control of the business of insurance as carried on by enemy corporations within the United States; the regulation of the granting of patents or copyrights to enemy aliens, and the use by citizens of the United States of patents owned or controlled by enemy aliens; and the seizure and sequestration of property in the United States owned by enemy aliens. An account of the action taken under the first two heads has already been given in our consideration of the topics of the mobilization of publicity agencies and foreign trade. To the Department of Justice was entrusted the general work of controlling enemy aliens and enemy-alien activities in the United States. To the Federal Trade Commission was given the enforcement of the provisions of the alien laws relative to the business of insurance, patents and copyrights. Finally, to a special war agency, known as the Alien Property Custodian, was given the duty of seizing, sequestering and administering all property belonging to enemy aliens in the United States.

The Alien Property Custodian.—One of the most important features of the Trading with the Enemy Act of Oct. 6, 1917, was that providing for the taking over by the Government of the United States of all property situated in the United States or any of its possessions belonging to an enemy or ally of enemy as defined by the Act. The terms "enemy" or "ally of enemy" were employed in quite a technical sense as defined in the Act. They included all persons, whether citizens of the enemy, or ally of enemy countries or not, within the military or naval lines of Germany and her allies, or any person residing outside of the United States and doing business within such lines. American citizens in Germany were thus deemed, for the purposes of this Act, to be "enemies," whereas German citizens in the United States were not. The latter, unless interned, were thus permitted to continue in trade and commerce and in the possession of their property so long as they remained in the United States and obeyed its laws. The purpose of the Act, in other words, was not to provide for the taking over of all property within the United States belonging to citizens of the enemy or ally of the enemy, but merely to prevent those countries, or persons residing within those countries, during the period of the war, from exercising any control over or deriving any profit from the use of property situated within the United States.

In marked contrast with most war legislation, this Act, though vesting the powers granted for the most part in the President, made express provision for the agency through which these powers were to be exercised. The office of Alien Property Custodian, unlike those of most of the other war agencies, thus had a statutory status. On Oct. 12, 1917, the President appointed A. Mitchell Palmer Alien Property Custodian, and by an executive order of the same date vested in him the exercise of the powers conferred by the Trading with the Enemy Act in so far as they related to the seizure and sequestration of property of the enemy or ally of enemy as above set forth. These powers were still further defined or broadened by a series of proclamations and executive orders subsequently promulgated by the President.

The operations of this agency have been on an enormous scale. The property taken over by it runs into hundreds of millions of dollars. Whenever there was reasonable ground for believing that a German-owned enterprise had been used as a means of securing control over industries or operated in a manner inimical to the interests of the United States, its affairs have been wound up and the property sold. The final disposition that will be made of the property and money thus sequestered rests with Congress, which in turn will be influenced by the conditions of the treaty of peace as finally signed.

AIRCRAFT CONSTRUCTION AGENCIES

Of all the branches of war activities of the United States none gave so much trouble or produced such apparently unsatisfactory results as that of aviation. Congress placed almost unlimited funds at the disposal of the Administration with which to build and operate a fleet of aircraft. The failure of the Government to meet expectations in respect to the actual construction of airplanes was due to a number of causes, one of which was its failure to work out a proper system of administration for the handling of aircraft matters. It is with this phase only of the question that we are here concerned.

National Advisory Committee for Aeronautics.—The first agency to be established to assist in the development of an aviation service was that known as the National Advisory Committee for Aeronautics. This service was created prior to our being drawn into the war by a section contained in the Navy Appropriation Act of March 3, 1915, which provided for the constitution of a Committee under that name, composed of 12 members representing principally the Army and Navy Air Services and Government scientific bureaus, which should have as its function "to supervise and direct the scientific study of the problems of flight with a view to their practical solutions, and to determine the problems which should be experimentally attacked and to discuss their solution and their application to practical questions" (*A. Y. B.*, 1915, p. 579). The Committee was constituted with Dr. William F. Durand of the Leland Stanford University as its chairman, Dr. S. W. Stratton, director of the Bureau of Standards as the secretary, and Dr. Charles D. Walcott, director of the Smithsonian Institution as chairman of its executive committee. The Committee has been a very active body. Especially important has been its work in analyzing the whole problem of aircraft construction and operation, in acting as a means for correlating and standardizing the work ot the War and Navy Departments, in making an inventory of aircraft facilities in the United States, in establishing close working relations with aircraft producers, and in assisting in the working out of plants for the production and testing of aircraft and the training of aviators. Itself not an operating service, it has thus been a valuable staff agency for all branches of the Government having to concern themselves with the problems of flight.

Joint Army and Navy Technical Aircraft Board.—This body was created early in May, 1917, for the purpose of standardizing "so far as possible the designs and general specifications of aircraft except Zeppelins." It was composed of officers of the Army and Navy selected by the Secretaries of War and the Navy who were believed to have special qualifications by reason of their scientific study of, or experience with, the construction and operation of aircraft. This Board made a number of recommendations, but it never played any controlling part in the formulation or execution of an aircraft programme.

Aircraft Production Board.—About the same time that the two Departments of War and the Navy were creating their Joint Technical Aircraft Board, the Council of National Defense took steps to create a somewhat similar agency. A resolution adopted April 12, 1917, provided for the creation of a body to be known as the Aircraft Production Board, the function of which was declared to be

> to consider the situation in relation to the quantity production of aircraft in the United States and to coöperate with the officers of the Army and Navy, and of other departments interested in the production and delivery to these departments of the needed aircraft in accordance with the requirements of each department.

This Board was organized under the chairmanship of Howard E. Coffin, a member of the Advisory Commission of the Council of National Defense. While this Board had no authority to commit the Government, it was very active in the formulation of plans and the giving of advice. Numerous contracts for airplanes and engines were entered into upon its advice.

Aircraft Board.—Though this body rendered services of value in bringing the officers of the War and Navy Departments into touch with establishments manufacturing airplanes or capable of participating in such work and in the development of an airplane programme, the fact that it had only recommendatory powers and no legal status led Congress to the decision that it should be superseded by a body to be created by it and with carefully defined duties and powers. It accordingly passed an act entitled "An Act to create the Aircraft Board and provide for its maintenance," which was approved Oct. 1, 1917. This Act provided for the creation of a body to be known as the Aircraft Board to be composed of not more than nine members, three of whom should be civilians appointed by the President, one of whom should be chairman of the Board; three officers of the Army to be appointed by the Secretary of War, one of whom should be the Chief Signal Officer of the Army; and three officers of the Navy to be appointed by the Secretary of the Navy, one of whom should be the Chief Constructor of the Navy. The functions of this Board were stated in broad terms to be those of "expending and coördinating the industrial activities relating to aircraft, or parts of aircraft, produced for any purpose in the United States, and to facilitate generally the development of air service."

In creating this Board Congress had in mind the separation of the two tasks of procuring aircraft and their subsequent utilization by the Army and Navy. The scope of duties of this body, however, was very much limited by an opinion given by the Acting Judge-Advocate-General of the War Department in February, 1918, in which he held that the Board had "only advisory or recommendatory functions." The effect of this order was, of course, to leave with the aircraft services of the two Departments full authority in respect to all aircraft matters whether relating to the adoption of types, the procurement of airplanes, or their subsequent operation.

This Board was constituted with Mr. Coffin, who had been chairman of the old Aircraft Production Board, as its chairman. Notwithstanding the great limitations upon its authority the Board entered vigorously upon the work of prosecuting a large aircraft programme. It devoted its chief efforts to a determination of the aircraft facilities and resources of the country, the stimulation of the production of spruce, linen, and other materials needed for the manufacture of airplanes, and to the development of a standard airplane motor. To a considerable extent interest in its work centered around its efforts in the last named direction, which finally resulted in the perfecting of the Liberty motor (see XI, *The Army*). For months an acute controversy raged over the merits of this engine. As finally modified it undoubtedly possessed merits of a high order, and though not adopted for all classes of airplanes, proved to be of great value both to ourselves and to our Allies, the latter calling for practically as many motors as could be produced.

The delay in the perfection of this motor, or at least to put it into production upon a large scale, the failure of the Government to secure the production of other motors and airplanes, and the widespread belief that there had been great inefficiency, if not positive fraud, in the expenditure of the huge sums, amounting to nearly $700,000,000, which had been voted for aircraft purposes, led to the demand for a searching inquiry into the whole subject. Two such inquiries were made, one by a committee of the Senate and one by Charles E. Hughes, at the request of the President, acting through or under the Department of Justice. Both of these inquiries resulted in reports which, while finding few if any evidences of fraud, did find much to criticize in the way the whole matter of aircraft production had been handled.

Bureau of Aircraft Production.—Responsibility for the actual procurement of aircraft and aircraft motors rested at all times, as has been pointed out, in the War and Navy Departments. In the War Department the service in charge of this work was the Signal Corps. It seems to be established that either this service failed to meet the responsibility resting upon it or a mistake was made in throwing upon the same service responsibility for both the procurement and operation of aircraft. To meet this latter consideration the President, by an executive order dated May 20, 1918, issued under the authority granted to him by the Overman Act of the same date, completely reorganized the Signal Corps and provided for the distribution of its duties among a number of distinct services. By this order the original duties of the Signal Corps, as a service in charge of military signalling, were carefully segregated from those pertaining to the Air Service. The former were placed under the immediate direction of the Chief Signal Officer of the Army, while the latter were entrusted to a new service known as Division of Military Aeronautics, under the direction of a Director of Military Aeronautics to be selected and designated by the Commander-in-Chief of the Army. At the same time provision was made for a new "executive agency" designated Bureau of Aircraft Production which, as set forth in the order, should have "full, complete and exclusive jurisdiction and control over the production of airplanes, airplane engines and aircraft equipment for the use of the Army." This Bureau, it was provided, should be in charge of a Director of Aircraft Production, to be appointed by the President, who should at the same time be chairman of the Aircraft Board and who should discharge his duties under the direction of the Secretary of War. Major-General William L. Kenly was appointed chief of the new Division of Military Aeronautics, and John D. Ryan, Director of Aircraft Production. Later, in August, 1918, Mr. Ryan was appointed Second Assistant Secretary of War and placed in general charge, not only of the services headed by him, but of the Division of Military Aeronautics as well.

There can be no question regarding the great improvement from the organization standpoint resulting from this order. At the time that the cessation of hostilities occurred, most of the administrative troubles that had interfered with the carrying out of the ambitious airplane programme of the Government had been largely overcome, and airplanes and airplane motors were being produced in quantity and shipped to our army and our allies in France (see also XI, *The Army*).

BUREAU OF WAR RISK INSURANCE

Though not the most important from the standpoint of its direct bearing upon the prosecution of the war, the legislation providing for the establishment and activities of the Bureau of War Risk Insurance in the Treasury Department is in other respects one of the most remarkable and interesting pieces of social legislation produced by the war. This legislation covers a number of distinct features which, though more or less closely related, require separate consideration in order that their character may be clearly understood.

Marine Insurance.—With the outbreak of the European War, the increased danger of loss due to mines and the activities of the belligerents' submarines, made it evident that private insurance companies would either refuse to write marine insurance against risks due to these causes, or in order to protect themselves would charge rates so high as practically to prohibit voyages taking vessels through the war zone. To meet this situation Congress, by an act approved Sept. 2, 1914, authorized the Government itself to enter this field and to write insurance of this character (*A. Y. B.*, 1914, pp. 40, 368). This act provided for the establishment in the Treasury Department of a Bureau of War Risk Insurance which should have the function, subject to the general direction of the Secretary of the Treasury, of making provision for the insurance by the United States of American vessels, their freight and passage moneys and cargoes shipped or to be shipped therein against loss or damage by the risks of war, whenever it shall appear to the Secretary that American vessels, shippers, or importers in American vessels are unable in any trade to secure adequate war risk insurance on reasonable terms. By an amending act approved June 12, 1917, the Bureau of War Risk Insurance, with the approval of the Secretary of the Treasury, was authorized to make provision for the reinsurance of vessels of foreign friendly flags, or their cargoes, when such vessels or their cargoes were insured by the Government of any country which is at war with an enemy of the United States, and to reinsure with the Governments of any such countries American vessels and their cargoes (*A. Y. B.*, 1917, p. 507). The authority of the Bureau to write marine insurance was yet further extended by an amending act of July 11, 1918, which authorized the Bureau to insure vessels of foreign friendly flags, their cargoes, etc., when such vessels were under charter or operated by the U. S. Shipping Board or a citizen of the United States, and the cargoes to be shipped in such vessels, whether or not they were so chartered or operated, whenever the Secretary of the Treasury found that such vessels were unable to secure adequate war risk insurance on reasonable terms from commercial companies (see also XIII, *Property Insurance*).

Mariners' Insurance.—The amending act of June 12, 1917, of which mention has been made, also authorized the War Risk Insurance Bureau to enter a new field of insurance. It thus authorized it, under the general direction of the Secretary of the

Treasury, to provide for the insurance of masters, officers and crews of American merchant vessels against loss of life or personal injury by the risks of war and for their compensation during detention in case of their capture by the enemy (*A. Y. B.*, 1917, p. 507). Furthermore it made it obligatory upon the owner of every American merchant vessel to ensure the master, officers and crew of such vessel against these contingencies whenever in the opinion of the Secretary of the Treasury the effecting of such insurance was desirable in the interest of the national welfare. This insurance, it was provided, could be effected either with the Bureau of War Risk Insurance or with private insurance companies provided the terms in the latter case were satisfactory to the Secretary of the Treasury.

Allotments to Dependent Families of Soldiers and Sailors.—Interesting as was this venture of the United States into the field of marine and mariners' insurance, it was, relatively speaking, thrown completely into the shade by the passage on Oct. 6, 1917, of an act which, though technically designated an act to amend the War Risk Insurance Act of 1914, was, in fact, an independent enactment authorizing the War Risk Insurance Bureau to enter an entirely new field. This act, which has been amended by the Soldiers' and Sailors' Relief Act of March 8, 1918, public resolutions of Feb. 12 and April 2, 1918, and the acts of May 20 and June 25, 1918, for the purpose of broadening the application and simplifying its procedure, had for its purpose the accomplishment of three things: to make provision for the support of members of the families of soldiers and sailors of the United States Army and Navy in so far as they are dependent upon them for support; to provide for the compensation of soldiers and sailors or their dependents in case of their disability or death while in the service; and to furnish the means by which such soldiers and sailors might insure themselves against death or permanent disability at a minimum cost. Though these three objects are closely related to each other, it is desirable in the interests of clearness that they should be separately considered.

With the adoption of the system of compulsory service it became imperative that provision should be made in some way for those cases where a man having persons dependent upon him for their support was drafted into the service. The system adopted by the United States and put into effect by the acts mentioned above rested upon the principle that the men themselves should do all that was in their power before assistance in any other way should be granted. The law thus provided for the making of certain deductions, known as "allotments," from the pay of enlisted men and their payment directly to the members of the families of such men dependent upon them for their support. These allotments were of two kinds: compulsory and voluntary. Every enlisted man having a wife or child under 18 years of age, or any age if insane or permanently helpless, or a divorced wife to whom he was under legal obligation of paying alimony, was compelled to "allot" $15 a month from his pay to be paid directly to them by the Government. In considering this obligation account should be taken of the fact that by previous enactment the minimum pay of enlisted men had been raised to $30 a month, or double what it had been in the past, much the most generous compensation paid to enlisted men by any Government in the world. The law, as originally enacted, provided for variations in the amount of this allotment according to the number of dependents. Due to the administrative difficulties involved in determining the amounts due, the system was changed by the amending act of June 25, 1918, to a flat rate of $15 a month in all cases.

In addition to these compulsory allotments to what were designated as "Class A dependents," enlisted men were permitted voluntarily to allot such further portions of their pay as they might desire, either to this class of dependents or to their parents, grandparents, brothers, sisters or grandchildren, who were designated as "Class B dependents."

Allowances to Dependent Families of Soldiers and Sailors. — Having taken steps to ensure that enlisted men would do their part in respect to providing for the support of those dependent upon them, the act further provided that the Government should do its share by making additional payments to such dependents. These payments, which are known as "allowances," range from $5 a month for a motherless child and $15 a month for a wife without children up to a maximum of $50 according to the number of dependent persons for whom provision must be made. These allowances are only paid when allotments are already being paid from the salaries of the enlisted men. If the enlisted man is making a compulsory allotment to his wife and children, he need allot only $5 additional to his Class B dependents in order to claim an allowance for them. If he is not making such a compulsory allotment, he must allot $15 to his Class B dependents in order to obtain for them the Government allowance. In the case of Class B dependents, it must be established, however, that they are dependent in whole or in part upon the enlisted man for their support.

Compensation of Soldiers and Sailors for Death or Disability.—The system of allotments and allowances was intended to make provision only for the time when an enlisted man, due to his enlistment, was unable to provide for the support of those dependent upon him by other means. It did not provide for the case when he was killed or permanently disabled. In the past this contingency has, as is well known, been provided for by the establishment of a pension system. The abuses of this system have been so enormous that the desire was almost universal that they should be guarded against, if possible, by some means. The solution of this problem was found in a system of compensation and of insurance.

The system of compensation for death and disability incurred in the service established by the act under consideration represents the adoption of the principle of compensation which has been so successfully applied in the case of industrial workers and which had already been adopted by the National Government in the case of its civil employees. The present act provided for a system analogous to the latter for the entire personnel of the army and navy, commissioned officers as well as enlisted men, regardless of rank or pay when employed in active service. Two classes of compensation payments were provided for: for death and for disability. The payment for death ranges from $20 to $75 a month according to the number of beneficiaries to be compensated, and is paid only to the widow, children and dependent father or mother (*A. Y. B.*, 1917, p. 354). This compensation is not paid automatically but only upon application on blank forms furnished by the Bureau of War Risk Insurance. Right to it accrues only when the death is incurred in the line of duty and was not caused by the decedent's own willful misconduct. The payment is made to the widow until remarriage and to a child until 18 years of age or marriage. The payment for disability is paid to the disabled person himself. If the disability is total, it varies from $30 to $95 a month, according to the size of the disabled man's family. In exceptional cases a sum not exceeding $20 a month additional may be paid for the services of a nurse. If the disability is partial, the compensation is a percentage of the amount payable for total disability varying according to the reduction in the earning capacity of the disabled persons and the size of his family. In certain specific cases of total disability, such as the loss of both hands or both feet or both eyes, or for becoming helpless and permanently bedridden, the sum of $100 a month may be paid. An important feature of this system is that it is uniform for both officers and enlisted men and takes no account of the variations in compensation of the persons covered by it. In this respect it represents a marked departure from the plan usually followed in the case of ordinary industrial compensation systems.

Insurance of Soldiers and Sailors against Death or Disability.—The compensation paid to soldiers and sailors or their families in case of the death or disability of the former is wholly a charge upon the general treasury of the Government; no contribution to its cost is made in any way by the men themselves. To supplement the provision thus made for meeting these contingencies, the act provided for a system of insurance to be administered by the Bureau of War Risk Insurance, adherence to which is voluntary on the part of enlisted men and commissioned officers, but to which all are encouraged to adhere. This system covers only death and permanent total disability. It is organized strictly according to the actuarial principles upon which private insurance companies conduct their business. The premium rates are based upon the American Experience Table of Mortality and interest at the rate of 3½ per annum, but no loading of the actual insurance cost thus determined is made for expenses of adminstration or profits. Neither is allowance made for the fact that the soldiers and sailors insured constitute what are known as extra-hazardous risks, nor is any medical examination required other than a favorable report of the Army or Navy surgeon or medical examining board at the time the insured enter the service. It results from these provisions that, not only are many of the personnel of the Army and Navy able to get insurance which, on account of the extra-hazardous character of their employment, they could not get at all, but they secure such insurance at a far cheaper rate than could possibly be obtained in a private insurance company. (See also XIII, *Life Insurance*, in *A. Y. B.*, 1917 and 1918).

As a whole the act constitutes one of the greatest pieces of social legislation ever enacted by any Government. As the Secretary of the Treasury in his annual report for 1918 says:

> No other Government has ever dealt so liberally with its soldiers and sailors and army and navy nurses, nor has any other Government apportioned its benefits more scientifically and equitably among those who have just claims upon the gratitude of their country.

II. INTERNATIONAL RELATIONS

CHARLES H. ALBRECHT

RUSSIA AND THE NEAR EAST

German Negotiations with Russia.—Very far-reaching in their effect on the relations of the nations of the world were the negotiations entered into between the Central Powers and the Russian Soviet Republic upon the conclusion of the armistice of Dec. 15, 1917. The year opened with the report that the negotiations had been broken off as a result of the terms insisted upon by the German delegates, which meant the separation from Russia of Poland, Lithuania, Courland and certain of the Baltic islands, including Moon Island, and the continued German occupation of these territories. The evident inconsistency of these terms with the Russian Soviet formula of "no annexations and no indemnities" and self-determination of peoples was but speciously covered by the German explanation that all these territories had expressed themselves in favor of freedom from Russia, hence the latter had no longer any interest in them, although continued German occupation of the territory in question was necessary for the maintenance of order until a stable government was established. To this it was added that the original Russian offer (*A. Y. B.*, 1917, p. 66) was a proposal for a general peace, and when this was not accepted by the Entente, Germany was no longer bound to her acceptance of the Russian formula, since the terms she would be willing to accept in the case of a general peace were manifestly different from those to which she could consent in the case of a separate peace with Russia.

It is true that there was a strong nationalistic sentiment in all these provinces, the inhabitants of which were for the most part distinct in race and language from the inhabitants of Great Russia beyond. The Soviet representatives indicated their willingness to abide by their formula and permit a free expression on the part of the population, but maintained that this could be obtained only if these districts were free of outside influence. The terms upon which the Germans insisted meant in effect the retention of occupied territory at least until the general peace settlement, evidently in the hope meanwhile of obtaining through the expression of non-representative assemblies, controlled by the upper classes, including the landowners, who were largely of German extraction, though they in fact represented a comparatively small minority of the total population, a close union with Germany under the aegis of a German prince. Such expressions, in fact, were registered through the instrumentality of these minorities in Courland, Lithuania, Livonia, and Esthonia.

In this impasse the Russian delegates proposed that the negotiations which up to that time had taken place in Brest-Litovsk, in Russian territory under German occupation, be transferred to Stockholm or some other neutral capital, but to this the German Government refused to agree, and the Russians again resumed discussions at Brest-Litovsk. No agreement having been reached by Jan. 14, when the armistice expired, it was extended and discussions continued, without, however, obtaining any modification of the German programme. The Bolshevik leaders in Russia apparently expected that democratic sentiment in Germany and Austria-Hungary would develop in favor of the Russian non-annexation programme and force the hands of their

Governments, but in this they were disappointed.

Peace with the Ukraine.—Ukrainia, which comprised the southeastern portion of Russia, extending from the Austro-Hungarian frontier to the Black Sea and including the richest section of Russia, had resisted the spread of the Bolshevik idea and took advantage of the disorganization of the country to follow nationalistic tendencies, long suppressed under Russian rule. An autonomous government under a Rada or legislative assembly was formed, and this government demanded independent representation at Brest-Litovsk. Although this demand was for a time resisted by the Soviet delegates, it was eventually acceded to, whereupon separate negotiations were entered into with the Central Powers, and on Feb. 9 a treaty of peace and a supplementary treaty were signed between the representatives of the "Ukrainian Republic," Germany, Austria-Hungary, Bulgaria, and Turkey.

The treaty of peace, which left undefined the boundaries between Russia and the Ukraine (to be made the subject of future agreement between the countries in question), fixed the Austro-Hungarian-Russian boundary as the western boundary of the Ukraine, and ceded to the latter the province of Cholm, in occupied Russian Poland, the population of which was partly Ruthenian (or Ukrainian) and partly Polish. This provision ceding Cholm to the Ukraine caused such dissatisfaction in the Polish sections of Austria that on Feb. 20 the Austrian Premier announced that the Austro-Hungarian Government and the representatives of the Ukraine Rada had signed a supplementary agreement by which the province of Cholm would not revert to Ukrainia, but that a mixed commission would be appointed to define the Polish-Ukrainian frontier, which would be delineated upon racial principles and with regard to the wishes of the population.

Another clause of the agreement provided that the evacuation of the occupied regions should take place immediately after the ratification of the treaty, and compensation for war expenses incurred by the negotiating states, as well as compensation for damages done the state or its subordinates by military measures in the war zones, including requisitions effected in enemy countries, was renounced. Compensation to civilian nationals of both parties for damages due to war laws by the privation of copyright, concessions, privileges and similar claims, or by the control, custody, management or liquidation of goods, or for injuries to life, health or property, committed outside the firing line and against the law of nations was, however, provided for in the supplementary treaty.

The exchange of products through state organizations at prices to be fixed by a mixed commission according to rates of exchange set out in the treaty was to begin without delay and continue until July 31, 1918. It was provided that the Russian customs tariff of January 13-26, 1903, should remain in force, and as a basis for economic relations with Germany and Austria-Hungary, to continue until six months after a general treaty of peace or until the conclusion of a definite treaty of commerce, the treaty of commerce and navigation concluded between Germany and Russia on January 29-February 10, 1894, as modified on July 15-28, 1904, and the similar treaty between Austria-Hungary and Russia of Feb. 15, 1906, both granting most-favored-nation treatment, were revived, subject to certain modifications specified in the treaty. Most-favored-nation treatment was also provided for as between the Ukraine and Turkey and Bulgaria. A forecast of a Central European customs union is found in the provision that the Ukraine would not pretend to the advantages that might be granted by Germany to Austria-Hungary or any other country bound to her by a customs union "or indirectly by another country allied with Germany, or with Austria-Hungary by a customs union." Similar provision was made in favor of Austria-Hungary and of the Ukraine.

By these provisions Germany and Austria-Hungary hoped to retain the favorable position they had enjoyed by treaty in the Russian markets before the war and to obtain an immediate exchange of German manufactured products for raw materials, particularly foodstuffs, of which they were in sore need, large stocks of which, especially wheat, they believed to exist in the Ukraine. Unpublished agreements were made by Germany and Austria-Hungary with the Ukraine for the supply of 1,000,000 tons of grain by July 1, 1918, an arrangement having been entered into for the division between the two powers of the foodstuffs so received. Either because supplies in the Ukraine were less than anticipated or because the peasants concealed and refused to sell their grain, the hopes of Germany and Austria-Hungary to add materially to their vanishing supplies of foodstuffs were doomed to disappointment. In an endeavor to obtain greater supplies German military forces assumed continually greater control of affairs in the Ukraine and finally dissolved the Rada, recognizing as more favorable to their interests the authority of a Hetman, or chief, with dictatorial powers, chosen by the Kiev Congress on April 13.

In the supplementary treaty signed contemporaneously with the peace treaty provision was made for the establishment of consular relations, the reëstablishment of political treaties previously concluded between Russia and the Central Powers, except where inapplicable or otherwise agreed upon by a mixed commission to be appointed, the reëstablishment of private rights, the reciprocal exchange of war prisoners and interned civilians, repatriation of the nationals of both parties, a general amnesty, and the disposition of merchantmen and cargoes that had during the war fallen into the hands of either party to the treaty.

Russia Breaks Off Negotiations.—On Feb. 11 the Russian delegates abandoned the conference at Brest-Litovsk, stating that while they would not sign the formal peace treaty proposed by the Central Powers, they regarded the state of war with Germany and her allies as ended, and that orders had been simultaneously given the Soviet authorities for complete demobilization on all fronts. This informal peace, however, failed to satisfy Germany, which ordered an immediate military advance into Russian territory, and in reply to Russian protests stated that the Russians themselves by breaking off the negotiations had put an end to the armistice. Efforts to resist the German troops were a signal failure (see III, *The European War*), and in view of the threat to Petrograd in the German advance the diplomatic representatives of the countries at war with Germany left Petrograd, the American Ambassador and his party, including the Siamese and Brazilian Ministers, for Vologda, the British representative and French Ambassador and another party, including the Italian, Serbian, Portuguese, Greek and Belgian representatives, for Finland. The British party succeeded in passing through the fighting area in Finland and reached Sweden. The French Ambassador and the other diplomatic representatives who left shortly after the British diplomatic representatives, however, failed to get through Finland, and the French Ambassador, together with his Italian and Serbian colleagues, joined the American Ambassador at Vologda.

Peace with Russia.—In order to stem the German advance the Bolsheviki hurriedly notified the Germans that peace would be accepted on their own terms and requested an armistice. This request the Germans refused, and military operations were continued in Russia up to the signature of the treaty of peace on March 3, 1918, and even thereafter against the protests of the Bolsheviki (see III, *The European War*).

The treaty of peace provided that all territory to the west of the line indicated in the treaty would no longer be under Russian sovereignty and would have no further obligations whatever to Russia arising from its former relations. This line now ran between the islands of Dagos and Worms, then between Moon Island and the mainland, beginning on the mainland northwest of the mouth of the Os in Livonia and crossing the Gulf of Riga, including Riga and traversing the Dvina to the east of Dvinsk to the termination of the old frontier of Courland, continuing to the southern extremity of Dryswjaty, passing to the west of Dryswjaty. The line then continued south-southwest, cutting the Szwentzjany-Lyntupy railroad line west of Widsy and Twerstach, taking in Michalischki and Gerwjany, crossing the Vilna-Smorgon railway line slightly to the west of Szlobodka, following the course of the Opita and the Gawja to its junction with the Niemen. Thence it followed the course of the Niemen and the Sjelwjanka to Nushany, thence to the Ukrainian frontier, which it met at Prushany. The territory thus separated from Russia was estimated to comprise 30,000 sq. miles and 56,000,000 inhabitants, or 32 per cent. of the entire Russian population. It contained one-third of the total Russian railway mileage, 73 per cent. of the total iron production, and 89 per cent. of the coal production of the country, and was the seat of other important industries. Russia undertook to refrain from all interference in the internal affairs of these territories and to permit Germany and Austria-Hungary to determine their future fate in agreement with their populations. Germany and Austria-Hungary agreed to evacuate the territory to the east of this line when general peace was concluded and Russian demobilization fully completed, except Livonia and Esthonia, which were to be "occupied by a German police force until security is guaranteed by their own national institutions and order in the state is restored." The districts of Kars, Erivan, and Batum in the Caucasus were to be evacuated without delay by the Russian troops and the boundary to be fixed as it existed before the Russo-Turkish war of 1877-8. A considerable portion of the population of this latter territory consisted of Armenians, who naturally dreaded the return to Turkish sovereignty. Russia was without delay completely to demobilize her army, including the forces newly organized by the Bolsheviki, and to transfer her warships to Russian harbors and keep them there till the conclusion of a general peace. The contracting powers were to refrain from all agitation or propaganda against other signatory Governments, this latter provision being evidently aimed at the Bolsheviki's attempts to spread their ideas in Germany and Austria-Hungary.

Russia agreed to conclude peace with the republican Government of the Ukraine, to recognize the treaty entered into by the latter with the Central Powers, to evacuate immediately Ukrainian territory, and cease all agitation or propaganda against the Government or public institutions of the Ukraine. Finland and the Aland Islands were to be evacuated by Russian troops, and the Russian fleet and naval vessels were to leave Finnish ports. All agitation or propaganda against the Finnish Government or institutions was to cease, and the fortifications erected on the Aland Islands to be removed with all possible despatch. The permanent non-fortification of the Aland Islands was to be made the subject of a special agreement between Germany, Russia, Finland, and Sweden, and Germany was given authority to invite other Baltic powers to participate in the framing of this agreement. The contracting powers agreed to respect the political and economic independence and territorial integrity of Persia and Afghanistan. The treaty also stipulated for the rapid evacuation and restitution to Turkey of the portions of East Anatolia occupied by Russia. Diplomatic and consular relations were to be resumed and prisoners of war exchanged. There was also a mutual renunciation of indemnities for war costs incurred by the contracting states and for damages caused them and their subjects by military measures in the war areas, including requisitions in the enemy country.

In a treaty with Turkey of the same date the two contracting parties declared that they considered all previous international instruments intended to create spheres of influence and exclusive interests in Persia as null and void and agreed to withdraw their troops from Persian territory.

An additional treaty of the same date between Germany and Russia provided for the rehabilitation of the political treaties between the two countries except as found incompatible with changed circumstances, in which case new treaties were to be entered into to supplant such clauses. Each party agreed to pay its public debt due to citizens of the other party, Germany thus securing favorable treatment with reference to the Russian public debt which had been repudiated by the Bolsheviki. Free access by Germany to Persia and Afghanistan through Russian territory and the indemnification of damages caused citizens of either party during the war were also provided for. The treaty of commerce and navigation of 1904 with Russia was again put in force, with a guarantee of the continuance of most-favored-nation treatment until 1925 and of the free export without duty of ores from Russia. The two Governments agreed to request the Norwegian Government to arrange for a continuation of the Spitzbergen conference of 1914 as soon as possible after the conclusion of a general peace, to the end that the international organization of the Archipelago be applied equally to both parties.

Subsequent Developments in Russia.—On March 11 President Wilson sent a sympathetic message to the all-Russian Congress of Soviets, on the eve of its meeting to pass upon the question of the acceptance or rejection of the Brest-Litovsk treaty, which contained this pledge:

> Although the Government of the United States is unhappily not now in a position to render the direct and effective aid it would wish to render, I beg to assure the people of Russia through the Congress that it will avail itself of every opportunity to secure for Russia once more complete sovereignty and independence in her own affairs and full restoration to her great *rôle* in the life of Europe and the modern world.

To this message the Congress sent a characteristic Bolshevik reply on March 14.

The Congress ratified the treaty by a vote of 453 to 30 on March 16 against the protest of the Caucasus, and Germany ratified the treaty some time later. A statement made by Ambassador Francis advising the Congress not to ratify the treaty called forth the protest of Germany.

On June 12 a preliminary agreement was signed between the Russian and Ukrainian delegates at Kiev, providing for a cessation of military activities, exchange of prisoners of war, and the negotiation of peace terms. The chief difficulty experienced concerned the boundary between the two countries. It was, however, reported that at the session of June 22 an agreement was reached for a referendum of the population of the disputed territory under the control of a mixed commission, to take place after the ratification of the treaty of peace and the withdrawal of the armies of both parties.

Relations with the Entente Allies.—On April 5 small contingents of Japanese and British forces were landed at Vladivostok for the protection of life and property, bringing forth a protest from the Soviet Government, and on April 14 it was announced that British and French troops had been landed at Murmansk, on the northeast coast of the Kola Peninsula, to reinforce a British marine detachment sent there some weeks before (see III, *The European War*). According to reports these troops were coöperating with the Soviet forces in repulsing an attack upon the Murman railway by the forces of the Finnish White Guard, Finland having aspirations toward Eastern Karelia, apparently encouraged by Germany. Early in July, however, it was announced that the Russian Foreign Minister had addressed a note to the British Government demanding the immediate reëmbarkation and withdrawal of their forces on the Murman coast which were guarding against a threatened Finnish-German attack valuable munitions and stores belonging to the associated Governments, shipped before Russia had made peace with Germany. On July 25 the Ambassadors of the associated Governments, including the American Ambassador, left Vologda for Archangel. Refused domicile here by the Soviet Government, they proceeded to Murmansk, but returned on Aug. 9 to Archangel, where a new provincial provisional government had been set up which had expelled the Soviet representatives (see also III, *Russia*).

Operations in Siberia.—On Aug. 3 the American Government made the following statement with reference to the Russian situation (see III, *Rus-*

sia) and the widespread demand for military intervention against the Bolsheviki and their German supporters:

In the judgment of the Government of the United States—a judgment arrived at after repeated and very searching considerations of the whole situation—military intervention in Russia would be more likely to add to the present sad confusion there than to cure it, and would injure Russia rather than help her out of her distresses. . . .

We are bending all our energies now to the purpose, the resolute and confident purpose, of winning on the western front, and it would in the judgment of the Government of the United States be most unwise to divide or dissipate our forces.

As the Government of the United States sees the present circumstances, therefore, military action is admissible in Russia now only to render such protection and help as is possible to the Czecho-Slovaks against the armed Austrian and German prisoners who are attacking them and to steady any efforts at self-government or self-defense in which the Russians themselves may be willing to accept assistance.

Whether from Vladivostok or from Murmansk and Archangel, the only present object for which American troops will be employed will be to guard military stores which may subsequently be needed by Russian forces and to render such aid as may be acceptable to the Russians in the organization of their own self-defense.

With such objects in view the Government of the United States is now coöperating with the Governments of France and Great Britain in the neighborhood of Murmansk and Archangel. The United States and Japan are the only powers which are just now in a position to act in Siberia in sufficient force to accomplish even such modest objects as those that have been outlined. The Government of the United States has, therefore, proposed to the Government of Japan that each of the two governments send a force of a few thousand men to Vladivostok, with the purpose of coöperating as a single force in the occupation of Vladivostok and in safeguarding, so far as it may, the country to the rear of the westward-moving Czecho-Slovaks; and the Japanese Government has consented.

In taking this action the Government of the United States wishes to announce to the people of Russia in the most public and solemn manner that it contemplates no interference with the political sovereignty of Russia, no intervention in her internal affairs—not even in the local affairs of the limited areas which her military forces may be obliged to occupy—and no impairment of her territorial integrity, either now or hereafter, but that what we are about to do has as its single and only object the rendering of such aid as shall be acceptable to the Russian people themselves in their endeavors to regain control of their own affairs, their own territory and their own destiny. The Japanese Government, it is understood, will issue a similar assurance. . . .

It is also the hope and purpose of the Government of the United States to take advantage of the earliest opportunity to send to Siberia a commission of merchants, agricultural experts, labor advisers, Red Cross representatives and agents of the Young Men's Christian Association accustomed to organizing the best methods of spreading useful information and rendering educational help of a modest kind, in order in some systematic way to relieve the immediate economic necessities of the people there in every way for which an opportunity may open.

The execution of this plan will follow and will not be permitted to embarrass the military assistance rendered to the Czecho-Slovaks.

It is the hope and expectation of the Government of the United States that the Governments with which it is associated will, wherever necessary or possible, lend their active aid in the execution of these military and economic plans.

The following statement was made by the Japanese Government, the question of possible intervention in Russia having been for some months the subject of active discussions in that country:

The Czecho-Slovak troops, aspiring to secure free and independent existence for their race and loyally espousing the common cause of the Allies, justly command every sympathy and consideration from the cobelligerents to whom their destiny is a matter of deep and abiding concern.

In the presence of danger to which the Czecho-Slovak troops are actually exposed in Siberia at the hand of the Germans and Austro-Hungarians, the Allies have naturally felt themselves unable to view with indifference the untoward course of events, and a certain number of their troops have already been ordered to proceed to Vladivostok. . . .

The Japanese Government, being anxious to fall in with the designs of the American Government and also to act in harmony with the allies in this expedition, have decided to proceed at once to dispatch suitable forces for the proposed mission. A certain number of those troops will be sent forthwith to Vladivostok. In adopting this course, the Japanese Government remain unshaken in their constant desire to promote relations of enduring friendship with Russia and the Russian people and reaffirm their avowed policy of respecting the territorial integrity of Russia and of abstaining from all interference in her internal politics. They further declare that upon the realization of the objects above indicated they will immediately withdraw all Japanese troops from Russian territory and will leave wholly unimpaired the sovereignty of

Russia in all its phases whether political or military.

The Czecho-Slovaks.—The story of the progress of the Czecho-Slovak troops toward Vladivostok was a most interesting one. Organized as a unit of the Russian army composed of Czech and Slovak prisoners of war, they found themselves in danger of capture by German troops at the time of the conclusion of peace between Russia and Germany. With difficulty escaping the German troops, they succeeded in negotiating an agreement with the Soviet Government by which the latter guaranteed them unmolested passage through Siberia to Vladivostok, whence they hoped to join the Allied forces fighting on the western European front. As an earnest of their good faith they surrendered to the Russian Government all their arms and equipment except a few rifles retained for their personal safety. The Soviet Government, however, evidently at the instigation of Germany, went back upon its agreement, and in their progress through Siberia the Czecho-Slovaks were constantly harassed and attacked by Bolshevik troops and German prisoners who were armed and incorporated in the Soviet forces for the purpose. A protest of the representatives of the associated Governments in their behalf was unavailing, the Soviet Foreign Minister alleging in reply that they had stirred up counterrevolutionary activities in Siberia, where several provisional governments had been organized (see also *Russia*). The Czecho-Slovaks, however, seem to have rigorously abstained from interfering in local politics and have kept themselves entirely independent of even these pro-Ally and anti-Bolshevik movements. (See also III, *The European War.*)

Bolshevik Outrages on Allied Subjects.—It was reported that on July 29 the Bolshevik Premier had issued a declaration of a state of war between Russia and Great Britain and her allies. This the Soviet Government later denied, stating that merely a "state of defense" had been proclaimed. The American Vice-Consul at Petrograd, however, informed the Department of State that he was notified on Aug. 2 of the existence of a state of war between Russia and the United States, whereupon he lowered his flag and turned over the interests of the United States to the Norwegian consul. The French and British consuls at Moscow were forcibly detained by the Soviet, although the American consul escaped similar action and was granted permission to leave. He, however, elected to continue at his post for a while, making every effort to obtain the release of his confrères. In reprisal for the arrest of the British consul, the Bolshevik Ambassador at London, M. Litvinoff, was placed under police supervision. On Aug. 29 the Soviet Government published a decree ordering the arrest of all French and British subjects between the ages of 18 and 40, and Bolshevik troops forcibly entered the British Embassy at Petrograd, killed the naval attaché who tried to defend it, and mutilated his body. The following protest was made by the British Government:

> We demand immediate reparation and the prompt punishment of anyone responsible for or concerned in this abominable outrage.
>
> Should the Russian Soviet Government fail to give complete satisfaction or should any further acts of violence be committed against a British subject, His Majesty's Government will hold the members of the Soviet Government individually responsible and will make every endeavor to secure that they shall be treated as outlaws by the Governments of all civilized nations and that no place of refuge shall be left to them.

Through the neutral missions still in Russia the Bolshevik authorities were warned by the Allies that they would be held personally responsible for the safety of consular and diplomatic officers detained in Russia, and on Sept. 8 it was announced that the Soviet had agreed to release the British and French diplomatic and consular officers in exchange for the release of the Bolshevik Ambassador at London if the Ambassador and all Russian citizens who wished to accompany him received a safe conduct and Holland, Norway and Sweden guaranteed their safe exit from England and their passage across Scandinavia. This agreement was carried out. Under orders of the Department of State the American consul at Moscow, last of the American consular officers to remain in territory controlled by the Bolsheviki, left Russia, arriving in Stockholm on Sept. 26.

Supplementary Russo - German Agreements. — After several months of negotiation between the German Government and representatives of the Soviet Government who proceeded to Berlin for the purpose, three agreements supplementary to the peace treaty of Brest-Litovsk were signed on Aug. 27. The treaties, which included a political, a financial, and a civil-law agreement, were promptly approved by the Soviet Government by an overwhelming majority, and ratifications were exchanged at Berlin on Sept. 6.

By these treaties Russia renounced all sovereign claims to Esthonia and Livonia and all interference in their internal affairs, agreeing that their future fate should be settled in accord with their population and that Esthonia and Livonia should have no obligations of any character to Russia arising out of the former sovereignty of the latter. An outlet for the transit of goods through Esthonia, Livonia, Courland, and Lithuania was assured to Russia.

Russia agreed to the payment of 6,000,000 marks to Germany, partly in gold and ruble notes, in five instalments due at fixed periods beginning Sept. 10 and ending Dec. 31, 1918, and partly in commodities in quarterly instalments continuing until March 31, 1920. Of this sum 1,000,000 marks were to be covered by a later convention provided their payment was not assured by the Ukraine and Finland when these countries concluded financial arrangements with Russia. Germany characterized this 6,000,000 marks as arising from the statement of an account, acknowledged by the Soviet Government, being the difference between the amount of the damages caused German subjects as a result of Russian confiscatory legislation and other acts for which the payment of damage was provided in the Brest-Litovsk treaty and the amount of such damages to Russian subjects by Germany, including compensation for goods requisitioned by German forces in Russia after the conclusion of the Brest-Litovsk treaty.

The treaty of Aug. 27 provided for a joint commission for the demarcation of all frontiers with the establishment of neutral zones between the fronts. Germany agreed to evacuate the territory occupied by her to the east of the eastern frontier of Esthonia and Livonia as soon as an agreement was reached as to this frontier. The evacuation of Russian territory east of the Beresina was to take place gradually, *pari passu* with the payment by Russia of the instalments provided for in the treaty. The evacuation of territory to the west of the Beresina was to await the conclusion of further agreements to be entered into before the conclusion of a general peace. Germany also consented to evacuate territories occupied by her on the Black Sea with the exception of the Caucasus after ratification of the treaty of peace to be concluded between Russia and the Ukraine, and to evacuate the country to the east of the Rostow-Worspesch railway line, together with a frontier zone to the west of the line, including Rostow, upon demand of Russia.

The property right of Russia in its warships seized by German forces after the ratification of the treaty of peace was recognized by Germany subject to an accord being reached between Russia, Finland, and the Ukraine with reference to the ownership of the property of the old Russian Empire. Germany, however, was to keep these vessels under her control until the signing of a general peace.

Germany agreed not to lend her aid to the governments set up in the Caucasus, with the exception of Georgia, the recognition by Germany of the autonomy of the latter being agreed to by Russia (see also "Caucasus," *infra*). A line in the Caucasus was fixed in the treaty, beyond which Germany agreed not to permit the advance of a third power. Germany was to receive one-fourth of the oil production of Baku in return for supplies of coal from territory occupied by Germany.

Germany agreed, so far as there were no provisions to the contrary in the Brest-Litovsk treaty or these treaties, not to interfere between Russia and its constituent parts and in particular not to cause or support the formation of independent states in Russian territory, while Russia agreed to employ all means at her disposal to remove the Entente forces in northern Russia, Germany guaranteeing that during these operations Russia would not be attacked by Finland. On Sept. 11 it was reported that the first instalment of the sum fixed in the treaty had been paid.

During September the Committee of Public Information published in the United States a series of documents obtained in Russia showing the intimate relations between Germany and the Bolshevik leaders from the inception of the movement and the funds placed at the disposal of these leaders from German sources.

American Note on Conditions in Russia.—On Sept. 22 the American Secretary of State sent the following telegram to American diplomatic representatives in allied and neutral countries:

> This Government is in receipt of information from reliable sources revealing that the peaceable Russian citizens of Moscow, Petrograd, and other cities are suffering from an openly avowed campaign of mass terrorism and are subject to wholesale executions. Thousands of persons have been shot without even a form of trial; ill-administered prisons are filled beyond capacity and every night scores of Russian citizens are recklessly put to death; and irresponsible bands are venting their brutal passions in the daily massacre of untold innocents.
>
> In view of the earnest desire of the people of the United States to befriend the Russian people and lend them all possible assistance in their struggle to reconstruct their nation upon principles of democracy and self-government, and acting therefore solely in the interest of the Russian people themselves, this Government feels that it cannot be silent or refrain from expressing its horror at this existing state of terrorism. Furthermore, it believes that in order successfully to check the further increase of the indiscriminate slaughter of Russian citizens all civilized nations should register their abhorrence of such barbarism.
>
> You will inquire, therefore, whether the Government to which you are accredited will be disposed to take some immediate action, which is entirely divorced from the atmosphere of belligerency and the conduct of war, to impress upon the perpetrators of these crimes the aversion with which civilization regards their present wanton acts.

Toward the end of October and the beginning of November overtures were made by the Bolshevik Minister of Foreign Affairs to the Allied Governments and the United States for an armistice and peace negotiations with the Bolshevik Government. Toward the end of the year practically all the neutral European Governments severed diplomatic relations with the Bolsheviki, and withdrew their diplomatic representatives from Russia.

Finland.—The independence of Finland, declared in July, 1917 (*A. Y. B.*, 1917, p. 111), was by the end of January recognized by Russia, Sweden, Germany, Norway, Switzerland, and France. Fighting, however, continued between the White Guards, or more conservative elements, and the Red Guards, supplemented by Russian Bolshevik troops. In February an address signed by 90 per cent. of the adult inhabitants of the Aland Islands, who were Swedish by race and language, proposing incorporation of the islands with Sweden, was presented to the Swedish King. Though this proposal was not acceded to by Sweden, the close proximity to the Swedish coast of the islands, upon which Russia had, when still in the war, contrary to the international agreement to which she was a party, erected fortifications, moved the Swedish Government to send there a small force of troops, which, however, were withdrawn on March 3. The White Guards sent to Sweden and Germany a simultaneous call for help against the Bolshevik troops, who were fighting on the side of their opponents. Sweden declined to interfere, but about Feb. 21 Germany landed considerable forces in Finland, eventually accomplishing the overthrow of the Red Guards and the withdrawal of the Russian Bolshevik forces. During the campaign German forces occupied the Aland Islands against the protest of the Swedish Government, informing the latter that the occupation was temporary and necessary to the existing military operations.

On March 7, 1918, a treaty of peace was concluded between Germany and Finland by which in consideration of the "intervention of Germany to obtain the recognition of the autonomy and independence of Finland by the other powers," Finland agreed not to cede any portion of her territory to a foreign power or to grant any foreign power any right of servitude over the territory under her sovereignty without first reaching an understanding with Germany in regard to the matter. The contracting parties agreed that the fortifications that had been erected by Russia on the Aland Islands should be removed as soon as possible, and that Germany, Finland, Russia, and Sweden should enter into an agreement at the earliest practicable date with reference to the permanent absence of fortifications upon the islands and their position with reference to military and naval considerations. It was provided that other Baltic powers might be asked to participate in these latter negotiations if Germany so desired. The treaty provided also for the negotiation of further conventions to take the place of the treaties between Germany and Russia that lapsed at the outbreak of the war. Indemnities for war expenses or damages were renounced.

A supplementary treaty of commerce and navigation, signed on the same date, provided for most-favored-nation treatment (with the exception in the case of Germany, of Austria-Hungary or any other countries that might be bound to her by a customs union) and the reëstablishment of the Finnish customs tariff of Jan. 1, 1914, to which was added the provision that during the life of the agreement this tariff might not be increased or extended by the imposition of duties upon free goods, at least as far as German goods were concerned.

Fighting between the Finnish factions still continued after the treaty, and German troops remained in Finland, the influence of the German Government being thrown in with the conservative classes with monarchical tendencies, although the trend of sentiment at the time of the declaration of independence and the recognition of the foreign powers early in the year was entirely toward a republic.

On Oct. 9 it was announced that Prince Frederick Charles of Hesse, brother-in-law of the German Emperor, had been elected King of Finland by the Finnish Landtag (see also III, *Finland*). This action was followed after a few days by the severance by France of the semi-official diplomatic relations which she had maintained with Finland. On Oct. 13 it was reported that Finland had requested Germany to withdraw her troops from Finnish territory.

A conference of delegates from Russia and Finland arranged to meet at Reval on July 20 to discuss a renewal of friendly relations and the question of the Russo-Finnish boundary, particularly the status of East Karelia. Germany was to take part in the discussions, which were subsequently transferred to Berlin at the request of the Soviet Government. Late in August, however, the negotiations had been broken off indefinitely, due to inability to reach an agreement.

Lithuania and Courland.—Following the action of the Courland Diet, which, on Sept. 21, 1917, announced the severance of Courland from Russia and requested the protection of the German Empire, the municipal council of Riga on Dec. 27 passed a similar resolution. The Diet in question, composed on the basis of estates, was formed under German occupation, and was described by the German socialist paper *Vorwärts* as still less representative of the population of Courland than the Prussian Diet with its three-class suffrage was of the Prussian population. This is evident when we consider that five-eighths of the population of Courland are Letts, although the 7.6 per cent. of Germans own 41.6 per cent. of the land. This Diet assembled at Mitau in March and expressed a wish for military and other conventions that would closely bind the country to the German Empire.

On Dec. 11, 1917, the Lithuanian National Council, elected by the Lithuanian Grand Diet of September, 1917, at Vilna and composed of representatives of the various political parties, passed a resolution proclaiming the independence of Lithuania with the capital at Vilna and her release "from all bonds whatsoever previously assumed with or imposed by neighboring states."

For some time the German authorities refused permission for the publication of this proclamation, although "in the establishing of the state and for the purpose of representing its interests during the peace negotiations," the National Council advocated "a permanent, firmly established relation of alliance between the Lithuanian State and the German Empire, which should be realized primarily in military and commercial conventions and in community of tariff and currency." On March 23, 1918, a delegation of the Lithuanian Council was finally permitted to present the proclamation thus framed to the German Imperial Chancellor, who in his reply said:

> We hereby recognize Lithuania as free and independent. The German Empire is prepared to lend Lithuania the required help and, in concert with Lithuania's population, to take the necessary measures. Conventions for the establishment of confederation with the German Empire will be made. The Imperial Government presupposes that the conventions will be to Germany's interest as well as Lithuania's, and Lithuania will take a share of Germany's war burdens, which are promoting Lithuania's emancipation.

It is understood that it was to forestall efforts of the German Government to have the Lithuanian National Council offer their crown to the King of Prussia that without consulting the German Government the Lithuanian Diet at Vilna on July 11, after a decision by a majority for a constitutional dynasty, chose the Duke of Urach, a Catholic prince of the cadet branch of the Württemberg royal family, as king. Considerable dissatisfaction with this action was manifested in certain sections of the German press.

Early in May, following the submission to the Department of State on April 25 of a lengthy memorandum on the status of Lithuania, prepared by the Lithuanian National Council, representing 700,000 Lithuanians in the United States, representatives of this Council called upon President Wilson and expressed the desire of the Council for the independence of Lithuania entirely free from Russia, Germany, and Poland. President Wilson expressed his sympathy with the condition of Lithuania and these national aspirations.

Esthonia and Livonia.—The Esthonian National Council, established by the Provisional Russian Government on March 30, 1917, and composed of representatives elected by universal suffrage, in November, 1917, proclaimed the independence of Esthonia, the resolution of the National Council being confirmed in January by a United Assembly authorized by the Council. The Assembly decided that the Esthonian Republic should be declared a permanently neutral country and international guarantees to that end were to be requested. The Assembly also unanimously passed a resolution opposing the occupation of the country by German troops. The elections for a Constituent Assembly, called for by the National Council, held early in February, though not completed due to the interference of the Bolsheviki, showed an enormous majority in favor of Esthonian independence, with a minority in favor of autonomy as a part of a Russian federation.

The "police" power in Esthonia and Livonia granted Germany under the Brest-Litovsk treaty was used to prohibit the National Council from carrying on its functions and substituting therefor assemblies of German creation, the dissolution of the town councils, and the substitution of German for Esthonian in the schools. The Landesrat, which in fact only expressed the wish of the German population, large landholders, together with some bourgeois (constituting 2.4 per cent. of the total population, 90 per cent. of which was Esthonian), on April 12 expressed a desire for a personal union with Prussia. A delegation went to Berlin with the petition and was received sympathetically by the Chancellor, who promised to aid them in separating themselves from Russia and said he would turn over their proclamation of separation to the Russian Ambassador, who, however, refused to receive it.

In April representatives of the National Council addressed the British, French and Italian Governments, requesting (1) a recognition of the independence of Esthonia with her ethnographic frontiers, including the islands of the Moon Sound; (2) a recognition of the provisional government authorized by the National

Council as the only legal power in Esthonia; and (3) permission to participate in the general peace conference, when held, so that the interests of the country might be protected and the question of perpetual neutrality and international guarantees introduced. To these communications the British, French and Italian Governments replied in the following month expressing sympathy with Esthonian aspirations, stating their readiness to accord provisional recognition to the Esthonian National Council as a *de facto* independent body until the peace conference, when the future status of Esthonia should be settled as far as possible in accord with the wishes of the population. While the Governments in question said they could not guarantee Esthonia the right to participate in the peace conference, they would do their utmost to see that the above principles were applied to the country.

The Caucasus and the Don Republic.—In the fall of 1917 the central provincial representation of Transcaucasia (the territory south of the Caucasus Mountains) decided not to recognize the Bolshevik Government, although the subject of a formal declaration of independence was not taken up until March or proclaimed until April. As early as the middle of January the Turkish commander addressed a note to the "independent government of Transcaucasia" suggesting peace negotiations, which took place but were imperiled by the continued advance of the Turkish army. The negotiations with Turkey were several times interrupted and renewed, the question of the recognition of Transcaucasian independence and of the Brest-Litovsk treaty being in the foreground. The situation was made difficult by the fact that although a majority of the population were Christian, the latter were partly Georgian and party Armenian and the most numerous single element were the Turko-Tartars. For a while the three elements apparently worked somewhat in harmony, but subsequently the common government, such as it was, seems to have been dissolved and the district divided according to the three elements of the population. The Georgian Republic proclaimed its independence on May 25, and in order to protect itself against the Turkish advance and safeguard its integrity, called upon Germany, which evidently looked with jealous eyes upon Turkish designs in Transcaucasia. Representations were made to Berlin in April, both by the Russian Government and by the Armenian National Council, in an endeavor to stop the massacre of the Armenians by the Turkish troops in Transcaucasia, who are reported to have wantonly killed 10,000 Armenians in a fortnight. It was later reported that the Georgian, Armenian and Tartar Republics had each entered into treaties with Turkey, but these treaties were apparently never ratified.

Ciscaucasia, the territory north of the Caucasus, comprising the provinces of Daghestan, Terek and Stravropol between the Black and Caspian Seas, proclaimed its independence in May and so informed the various belligerent and neutral Governments. This state, however, overlapped the territory stretching from the Caucasus to the Ukraine claimed by the Don Republic which soon after proclaimed its independence (see III, *Russia*), but was not recognized by any other government. An independent government was also set up in the Crimean peninsula.

Rumania.—As a result of the arrest of the Rumanian Minister at Petrograd by the Soviet authorities, the entire diplomatic corps, headed by the American Ambassador, protested on Jan. 14 and demanded his release on the ground of a flagrant violation of the rights of diplomatic representatives. This was granted by the Bolsheviki, but an ultimatum was sent to Rumania demanding the free passage of Russian troops through Jassy, the arrest by the Rumanians of certain Russian troops with whom were Austrian propagandists having been the cause assigned for the arrest of the Rumanian Minister. Lenine then ordered the arrest of the Rumanian King and on Jan. 28 it was announced that diplomatic relations with Rumania had been broken. On Feb. 17 it was reported that the Soviet Government had sent a further ultimatum to Rumania demanding the evacuation of Bessarabia and the right to transport Russian troops through Rumania and Bessarabia.

Under pressure from the German Government the Cabinet of Bratiano was forced to resign and a new Cabinet favorable to peace with Germany came into power (see III, *Rumania*). On Feb. 23 negotiations between Rumania and the Central Powers began, as a result of which there was signed on March 5 a preliminary peace treaty by which Rumania agreed to an immediate evacuation of Austro-Hungarian territory and the demobilization of the greater part of her forces, guaranteed to aid to the extent of her power the transportation by her railroads of German troops bound for Odessa, Moldavia and Bessarabia, and agreed to certain territorial cessions, set out in detail in the final treaty signed on May 7.

By this treaty of May 7 Rumania ceded to Bulgaria the territory which she obtained by the treaty of Bucharest of 1913 with a "rectification" in favor of Bulgaria, and to the Central Powers, to be held under their common authority, the Dobrudja to the north of this new frontier between the upper delta of the Danube and the Black Sea to the Channel of St. George, Rumania being guaranteed an outlet for her commerce to the Black Sea through Czernavoda-Contanza. A "rectification" of the Rumania-Austro-Hungarian frontier resulted in the cession to Austria-Hungary of strips of territory of high strategic value aggregating some 3,000 sq. miles, taking in all the chief mountain passes along the Transylvanian frontier, and including cessions that would insure to the Central Powers the control of the Danube along its entire length. German troops with extensive rights of requisition were to remain in occupation of the greater part of Rumania at the expense of the latter, which was required to continue the demobilization of the greater part of her army and to turn over to the Central Powers to be held until the conclusion of a general peace all of her munitions except certain specified amounts. A civil officer of occupation was attached to the Rumanian Government. Provision was also made for the conclusion of a new Danube navigation convention as a result of negotiations with Germany, Austria-Hungary, Bulgaria, and Turkey to be held in Munich as soon as possible after the ratification of the treaty, which stipulated that in future the Danube Commission should only comprise representatives of states situated on the Danube or the European coasts of the Black Sea, thus assuring a control of the commission by Germany and her allies. Germany, Austria-Hungary, Bulgaria, and Turkey were granted the privilege of maintaining warships on the Danube, and the Rumanian *ad valorem* duty of 1½ per cent. on imports and exports was to be abolished from the date of the ratification of the treaty.

Although the treaty of peace provided for a mutual renunciation of indemnities for the expenses incurred by the contracting states in the operations of the war, provisions of the treaty of the same date between Rumania and Germany provided that Rumania should make reparation to Germans for all damages suffered in Rumanian territory by reason of the military operations of any of the belligerents and to neutrals who suffered damage as a result of German military operations, and this in spite of the renunciation by Rumania of all reparation for damages, including requisitions and contributions, resulting from the military measures of Germany on Rumanian territory.

In addition to securing the Rumanian harvests of 1918 and 1919 and an option on the entire harvests for the next two years, Germany obtained from Rumania the monopolistic control of all the oil wells of the latter, for the exploitation of which several large companies were formed in Germany. The Bucharest Czernavoda - Contanza railway line was also leased to a German company for 99 years. The Rumanian peace treaty, together with its supplementary treaties, was ratified by the German Reichstag early in July, the independent Socialists voting in opposition to the treaty.

On April 2 it was reported that an agreement had been concluded between Russia and Rumania providing for the evacuation of Bessarabia by Rumania within two months, the exchange of prisoners, and exportation of the surplus of the Bessarabian grain supply to Rumania. On April 9 the Bessarabian Diet, by a vote of 86 to three, decided in favor of union with Rumania, which accepted the union against the protests of the Ukrainian Rada. Although the treaty of peace with Germany contained no stipulation with reference to the political adhesion of Bessarabia, it was understood that the Central Powers would not oppose Rumania's expansion in the region of Bessarabia.

On Nov. 5 the American Secretary of State again expressed to the Rumanian Government the deep and constant sympathy of the American Government with the "aspirations of the Rumanian people without as well as within the boundaries of the Kingdom." He added that the Government of the United States would "not neglect at the proper time to exert its influence that the just political and territorial rights of the Rumanian people may be obtained and made secure from all foreign aggression."

Turkey.—After the conclusion of peace with Rumania difficulties arose between Bulgaria and Turkey with reference to the retrocession of the strip of territory in the Maritza region, ceded by Turkey to Bulgaria on Sept. 15, 1915, just before the latter entered the war. Turkey, according to reports, insisted not only on the retrocession of this strip as compensation for the territory obtained by Bulgaria in the Dobrudja, but on further compensation in the Kavalla-Seres region of Greece if Saloniki were to be assigned to Bulgaria, which was clamoring not only for Saloniki but for additional territory in the Dobrudja, the northern part of which was still held by the Central Powers as a whole. Germany's attempts to arbitrate between the rival claims led to no solution of the difficulty, Bulgarian offers of retrocession being insufficient to meet Turkey's demands.

On June 17 the American Minister at Teheran reported that Turkish forces at Tabriz, Persia, had occupied the American Consulate and pillaged the American hospital, a Presbyterian mission institution, over the protest of the Spanish consul, who was in charge of American interests. An explanation was immediately demanded by the American Government, which, though relations had been broken, was not at war with Turkey. The Ottoman Government reported that difficulty was experienced in ascertaining the facts, but early in August it was reported that a reply from the Turkish Government had been received to the effect that no affront to the United States was intended.

The Oppressed Nationalities of the Austro-Hungarian Empire.—Delegates representing the various nationalities subjected to Austro-Hungarian rule, including the Czecho-Slovaks, the Jugo-Slavs, the Poles, the Italian irredentists, and the Rumanians, met at Rome on April 8-10 and united in affirming the following principles:

1. Each of these peoples proclaims its right to establish its own nationality and state unity, to complete this unity, and to attain full political and economic independence.
2. Each of these peoples recognizes in the Austro-Hungarian monarchy the instrument of Germanic domination and the fundamental obstacle to the realization of its aspirations and its rights.
3. The assembly, consequently, recognizes the necessity for a common struggle against the common oppressors, in order that each people may attain its complete liberation and complete national unity as a single free state.

Efforts were made to adjust at the same time the conflicting territorial claims of the secret treaty of April 26, 1915, between Great Britain, France, Russia, and Italy, preceding Italy's entry into the war and pledging her certain Austro-Hungarian territories in the event of Allied success, and those of the declaration of Corfu of July 20, 1917, in which the Serbians and the Jugo-Slavs joined to set up a "Kingdom of the Serbs, Croats and Slovenes" and outlined its boundaries. These efforts resulted in the adoption of the following resolution by the Italian and Jugo-Slav delegates, which though not officially accepted by the Italian Government, were sympathetically received by the Government and the more liberal organs of the Italian press:

1. As regards the relations between the Italian nation and the nation of Serbs, Croats, and Slovenes—known also under the name of the Jugo-Slav nation—the representatives of the two peoples recognize that the unity and independence of the Jugo-Slav nation is a vital interest of Italy, just as the completion of Italian nationality is a vital interest of the Jugo-Slav nation. And therefore the representatives of the two peoples pledge themselves to use their utmost effort to the end that during the war and at the moment of peace these aims of the two peoples may be fully attained in their entirety.

2. They affirm that the liberation of the Adriatic Sea and its defense against every actual and eventual enemy is a vital interest of the two peoples.

3. They pledge themselves to resolve amicably, in the interest of future good and sincere relations between the two peoples, the various territorial controversies on the basis of nationality, and the rights of peoples to decide their own fate, and in such a manner as not to injure the vital interests of the two nations, to be defined at the moment of peace.

4. The nuclei of one people which may have to be included within the frontiers of the other shall be guaranteed the right to have their own language, culture, and moral and economic interests respected.

On May 29 Secretary Lansing announced that "the nationalistic aspirations of the Czecho-Slovaks and the Jugo-Slavs for freedom have the earnest sympathy" of the United States Government. This was supplemented by a further statement of June 28, which to clear up all misunderstanding, "announced the position of the United States Government to be that all branches of the Slav race should be completely freed from German and Austrian rule." In June the raising of troops in the United States for a Slavic legion was approved by President Wilson and the Senate Committee on Military Affairs. Following similar action on the part of France, Italy, and Great Britain, Secretary Lansing in a communication to Professor Masaryk, the president of the National Council and head of the Czecho-Slovak Government, recognized the belligerency of the Czecho-Slovaks and the National Council as a *de facto* belligerent government. On Sept. 26 the Italian Government recognized the nationalistic aspirations of the Jugo-Slavs. The United States also on Nov. 2 followed France and Great Britain in recognizing the Polish army in France as a "co-belligerent and allied force" in the war.

On Oct. 18 the provisional Czecho-Slovak Government, with headquarters at Paris, issued a "declaration of independence", signed by Professor Masaryk and the Ministers of National Defense and Foreign Affairs which, after outlining the historic rights of these peoples to independence, and the misrule of Austria and the failure of that country to keep its pledges to the Czechs and Slovaks, proclaimed a republic on the basis of universal and equal suffrage modeled after that of the American democracy and the principles laid down by President Wilson for the liberation of oppressed nationalities. (See also III, *Czecho-Slovakia.*)

An agreement between the Serbian Prime Minister and delegates of the National Council set up at Agram as the governing body of the Serbians, Croats and Slovenes of the disintegrating Austro-Hungarian Empire (see III, *Austria-Hungary*) was reached at Geneva on Nov. 7. By this agreement the Jugo-Slavs of Austro-Hungary pronounced for incorporation with Serbia and requested of the associated Governments the recognition of the Agram National Council as the supreme power of the newly organized Jugo-Slav state and the recognition of the Jugo-Slav troops as a belligerent and friendly force until the terms of the union with Serbia were definitely worked out and the union consummated.

NEUTRAL EUROPEAN COUNTRIES

Holland.—Toward the end of 1917 representatives of the Dutch Government met representatives of the British, French and Italian Governments and of the American War Trade Board in an endeavor to arrive at an agreement with reference to the issuance of licenses by the associated Governments for the exportation of goods to Holland and the utilization of Dutch shipping, which had been lying idle for months in Dutch and foreign ports. Although a tentative chartering agreement was arrived at and a comprehensive trade agreement was offered by the associated Governments, it became more and more evident that Holland's position in relation to Germany practically prevented her from fulfilling any satisfactory agreement with reference to her shipping, and preparations were made for the requisitioning by the associated Governments under the right of angary of such shipping as was in their ports. This action was deferred several times in the hope of a satisfactory proposal from Holland, but finally a proclamation of the President of the United States dated March 20 ordered the taking over and employment of all Dutch vessels in American ports in view of the imperative military needs of the United States. In a statement issued simultaneously the President reviewed the course of the negotiations, pointed out Holland's unwillingness or inability, due to Germany's attitude, to carry out the temporary chartering agreement, of which prompt performance was the essence, or to take action upon the general agreement, and expressed sympathy with Holland's difficult position—difficult because Germany's constant interference prevented her from freely carrying out her will in the matter. However, a statement of March 30, signed by the Dutch Premier and the Minister of Foreign Affairs, characterized the taking over of the Dutch vessels as "an act which is indefensible from the point of view of international law and apart from legal considerations is unjustifiable when taken against a friendly nation." They denied that German action had made performance of the provisional agreement impossible, although such interference on the part of Germany was abundantly shown in a report of the negotiations made by the Minister of Foreign Affairs to the States-General on March 12, and laid the blame largely upon the associated Governments, denying that Holland would have been unable to carry out an agreement had it been entered into one. In a reply of April 12 to this statement Secretary Lansing referred to the patience of this Government in view of the fact that the Dutch tonnage which it urgently needed and for which it had tried to negotiate had been lying idle for the greater part of a year, and pointed out that Dutch interests would be liberally taken care of by this Government. He denied that the action taken was of an unfriendly character and stated that Holland still controlled the greater part of her tonnage, ample for her domestic and colonial needs.

The British Government, acting at the same time as the American Government, also requisitioned Dutch ships in its ports. In its reply to the Dutch Government's statement of protest of March 30, the British Government, after reviewing the negotiations and the difficulties encountered in obtaining an arrangement with the Dutch Government, adduced considerable evidence to refute the contention of the latter that the right of angary had fallen into desuetude.

It was announced on Oct. 19 that negotiations for an economic agreement between Holland and the Entente Governments, acting with the United States War Trade Board, would be resumed in London and that Holland would release tonnage to bring to Holland the balance of the grain due her under the original chartering agreement. It was also stated that the United States had offered to place 100,000 tons of coal at the disposition of Holland on condition that Dutch vessels be sent to lift the coal and that the Dutch Government prohibit the exportation of foodstuffs to Germany. Late in November an agreement was reached between Holland and the associated Governments by which the latter agreed to license goods needed by Holland.

Scandinavia.—Economic agreements were entered into during the year by the Allied Governments and the United States War Trade Board with Norway, Sweden and Denmark, in the order named, the agreement with Norway bearing date of April 30 and that with Denmark having been signed on Sept. 18. By each of these agreements the neutral country agreed to permit freely the exportation of certain goods required by the associated Governments, and in return the latter agreed freely to license for export quantities up to specified limits of goods needed for the national economy of the Scandinavian country as far as they could be spared by the associated Governments. Each of the neutral countries guaranteed that such goods, when received, would not be permitted reëxport in any form, and also agreed to specified limitations upon the export of certain goods of national production, thus preventing quantities in excess of those agreed upon reaching the Central Powers. In addition, Sweden agreed to the chartering of 400,000 tons of shipping to the associated Governments for service partly within, and partly outside of, the danger zone. An amount of Norwegian and Danish tonnage covering practically all the excess over that required for national needs was in the service of the associated Governments before the conclusion of the agreements with those countries.

Spain.—After negotiations between the United States and Spain, extending over more than a month, ratifications of an agreement were exchanged on March 7. Under this agreement the United States was able to obtain supplies, such as mules and army blankets, needed for the American Expeditionary Forces, and the Allies, pyrites, minerals, and manufactured wool, in addition to which Spain agreed to permit the export of certain other goods to an extent permitted by domestic requirements. In return the United States assured to Spain fixed supplies of cotton and petroleum sufficient for her own needs but insufficient to permit hoarding by German agents in Spain. The shipment of railway supplies to Spain was facilitated, and other supplies were offered as far as they could be spared after the satisfaction of the needs of the United States and its associates in the war. At the same time (March 6) there was signed an agreement between France and Spain, by which, in addition to certain concessions on the part of the Spanish and French Governments with reference to the export and import of both Spanish and French goods, the French Government was enabled to secure a large credit in Spain to be used for the payment of supplies purchased by France from Spanish sources. Agreements had previously been entered into between Spain and Great Britain and Italy by which the latter countries obtained needed supplies. During the summer negotiations were opened at Madrid by the United States Government, as a result of which credit arrangements were made to cover the purchase in Spain of military and other requirements of this Government without the previous heavy loss in exchange.

After many ineffectual protests against the continued sinking of Spanish vessels by German submarines, the Spanish Government early in August sent a stiff protest to Germany, in which it stated its intention to confiscate a German vessel interned in a Spanish port for every Spanish vessel so sunk. On Sept. 1 an interned German vessel was seized as a result of the torpedoing of the Spanish steamer *Ataz-Mendi*, and it was announced that the Spanish Government had decided to take over all German vessels that had sought refuge in Spanish ports. The German Government is understood to have taken the position that while she was willing to compensate Spain for vessels illegally sunk, she would only do so after an exchange of views in each particular case, and no compensation would be given for vessels sunk in the danger zone or carrying contraband. It was further indicated that any seizure by Spain of German vessels would be regarded as a hostile act. The decision of the Cabinet to seize German vessels in Spanish ports was apparently never consummated, and a compromise was finally reached by which Germany turned over seven vessels to Spain and promised further compensation in kind for vessels sunk under circumstances for which the German Government would accept responsibility.

THE COUNTRIES ASSOCIATED AGAINST GERMANY

Military Service Conventions.—On July 30 ratifications of military conventions between the United States and Great Britain and Canada signed on June 3 were exchanged and the conventions went into effect. The conventions provided that all male citizens or subjects of the countries in question within the designated ages who did not enlist or enroll in the services of their own country or return thereto within the period designated in the conventions should be liable to military service in the country in which they were, unless exempted by the authorities of their own country or entitled to exemption by the laws of the country in which they were, such service not to operate as a loss of nationality. In the convention with Great Britain it was provided that no American citizen or British subject who before proceeding to Great Britain or the United States, respectively, was ordinarily resident in a place in the possessions of the United States or in the British dominions where the law did not impose compulsory military service should by virtue of the convention be made liable to such service except in the event that compulsory military service should be subsequently applied to such portion of the British dominions, thus leaving Irish and Australians outside the convention.

Conventions along the same lines were entered into with Italy, Greece and France on Aug. 24 and 30 and Sept. 3, respectively. The conventions with France and Greece were ratified by the Senate on Sept. 19, and that with Italy on Oct. 24.

Denunciation of Commercial Agreements.—On April 25 the French Government announced that all treaties and agreements then in effect to which France was a party affecting commerce, navigation, and industry, would be denounced by her so that by April, 1919, none of them would any longer be in force. This she desired to do so that she might negotiate new treaties with all countries more in conformity with changed economic conditions, as caused by the war, and properly protect her national industries and her economic life. For this purpose she deemed the period of transition between war and peace, with the economic rearrangement consequent thereon, most suitable. The following month the British Chancellor of the Exchequer announced in the House of Commons, in reply to a question, that the British Government intended also to denounce all commercial conventions providing for most-favored-nation treatment.

Canadian-American Fisheries Conference.—In order to increase the fish production and to put an end to certain difficulties that had arisen in connection with Canadian and American fishing rights, conferences were held at various points in the United States and Canada between representatives of the two countries, as a result of which the Secretary of Commerce on Feb. 20 issued an order permitting the fishing vessels of Canada and other nations associated with the United States in the war to proceed directly with their cargoes of fish from the fishing grounds to American ports, and also directly on the outward trip from the ports to the fishing banks. On March 8 the Canadian Government issued an order-in-council, valid for the period of the war, permitting American fishing vessels without license or the payment of fees not charged to Canadian vessels to enter any Canadian port for the purpose of making purchases of supplies and outfits, repairing their implements, dressing and salting their catches on board ship, shipping their crews and transshipping their catches, and making local sales upon payment of duty. Certain embarrassing conditions on Lake Champlain were also removed by the Canadian authorities.

THE FAR EAST

Sino-Japanese Agreements.—Representatives of the Japanese and Chinese Governments signed on May 19 military and naval agreements providing for concerted action in the event that conditions in eastern Siberia required military action on the part of the signatory powers. Co-operation of Japanese troops in Chinese territory opposite the Sino-Siberian frontier and a joint expedition into Siberia were contingencies covered in the agreements, according to paraphrases thereof made public in China. The agreements provided further for the mutual exchange of military supplies and materials, war maps and reports and the construction of necessary military railways, telegraph and telephone lines, these latter to be removed at the conclusion of military operations. Each country agreed to supply military experts at the request of the other, and it was provided that military areas and other matters relating to these operations should be decided by the military authorities of the two countries, whenever it was deemed necessary, in accordance with the military strength of each country. Delegates appointed by the military authorities of the signatory powers were to work out the details of the actual enforcement of the agreement, which, however, was to be null and void with the conclusion of the operations of the two countries against Germany and Austria-Hungary, at which time Japanese troops in Chinese territory were to be withdrawn.

Chinese Loans.—On July 29 the Department of State made an announcement with reference to its policy toward loans to China, from which the following extract is quoted:

> China declared war against Germany very largely because of the action of the United States. Therefore this Government has felt a special interest in the desire of China so to equip herself as to be of moral specific assistance in the war against the Central Powers. Until the present time the engagements of the United States in preparing to exert effectively its strength in the European theatre of war has operated to prevent specific constructive steps to help China realize her desires.
>
> Recently, however, this Government felt that, because of the approach to Chinese territory of the scenes of disorder, a special effort should be made to place proper means at the disposal of China. Consequently a number of American bankers, who had been interested in the past in making loans to China and who had had experience in the Orient, were called to Washington and asked to become interested in the matter. The bankers responded very promptly, and an agreement has been reached between them and the Department of State which has the following salient features:
>
> *First.*—The formation of a group of American bankers to make a loan or loans and to consist of representatives from different parts of the country.
>
> *Second.*—An assurance on the part of the bankers that they will coöperate with the Government and follow the policies outlined by the Department of State.
>
> *Third.*—Submission of the names of the banks which will compose the group for the approval by the Department of State.
>
> *Fourth.*—Submission of the terms and conditions of any loan or loans for approval by the Department of State.
>
> *Fifth.*—Assurances that if the terms and conditions of the loan are accepted by this Government and by the Government to which the loan is made, in order to encourage and facilitate the free intercourse between American citizens and foreign States which is mutually advantageous the Government will be willing to aid in every way possible and to make prompt and vigorous representations and to take every possible step to insure the execution of equitable contracts made in good faith by its citizens in foreign lands.
>
> It is hoped that the American group will be associated with bankers of Great Britain, Japan and France. Negotiations are now in progress between the Government of the United States and those governments which it is hoped will result in their coöperation and in the participation by the bankers of those countries in equal parts in any loan which may be made.

This announcement, made after an agreement was reached with American banking houses interested in the Far East and after an exchange of ideas with Great Britain, France and Japan, foreshadowed a return to a consortium in the matter of loans to China. It was felt in many circles anxious to see real harmony and progress in China that the loans extended for some time past by individual interests, particularly Japanese, and made both to the Government at Peking and to provincial authorities in the south as well as the north, had been expended largely on military campaigns against other sections of the country, torn by civil strife, and had added to, rather than helped to solve, China's internal difficulties (see III, *China*).

LATIN AMERICA

Mexico.—President Wilson availed himself of the opportunity afforded by the reception on June 7 of a delegation of Mexican newspaper editors visiting the United States to set forth again his broad views of Pan-Americanism by agreement and coöperation. The following passages of his address to the editors are noteworthy:

> I have never received a group of men who were more welcome than you are, because it has been one of my distresses during the period of my Presidency that the Mexican people did not more thoroughly understand the attitude of the United States toward Mexico. I think I can assure you, and I hope you have had every evidence of the truth of my assurance, that that attitude is one of sincere friendship. And not merely the sort of friendship which prompts one not to do his neighbor any harm, but the sort of friendship which earnestly desires to do his neighbor service.
>
> My own policy, the policy of my own administration, toward Mexico was at every point based upon this principle, that the internal settlement of the affairs of Mexico was none of our business; that we had no right to interfere with or to dictate to Mexico in any particular with regard to her own affairs. Take one aspect of our relations which at one time may have been difficult for you to understand: When we sent troops into Mexico, our sincere desire was nothing else than to assist you to get rid of a man who was making the settlement of your affairs for the time being impossible. We had no desire to use our troops for any other purpose, and I was in hopes that by assisting in that way and then immediately withdrawing, I might give substantial proof of the truth of the assurances that I had given your Government through President Carranza. . . .
>
> Some time ago, as you probably all know, I proposed a sort of pan-American agreement. I had perceived that one of the difficulties of our relationship with Latin America was this: The famous Monroe doctrine was adopted without your consent, without the consent of any of the Central or South American States. If I may express it in the terms that we so often use in this country, we said, "We are going to be your big brother, whether you want us to be or not." We did not ask whether it was agreeable to you that we should be your big brother. We said we were going to be.
>
> Now, that was all very well so far as protecting you from aggression from the other side of the water was concerned, but there was nothing in it that protected you from aggression from us, and I have repeatedly seen the uneasy feeling on the part of representatives of the states of Central and South America that our self-appointed protection might be for our own benefit and our own interests and not for the interest of our neighbors.
>
> So I said, "Very well, let us make an agreement by which we will give bond. Let us have a common guarantee, that all of us will sign, of political independence and territorial integrity. Let us agree that if any one of us, the United States included, violates the political independence or the territorial integrity of any of the others, all the others will jump on her." I pointed out to some of the gentlemen who were less inclined to enter into this agreement than others that that was in effect giving bonds on the part of the United States that we would enter into an arrangement by which you would be protected from us.
>
> Now, that is the kind of agreement that will have to be the foundation of the future life of the nations of the world, gentlemen. The whole family of nations will have to guarantee to each nation that no nation shall violate its political independence or its territorial integrity.
>
> That is the basis, the only conceivable basis, for the future peace of the world, and I must admit that I was ambitious to have the states of the two continents of America show the way to the rest of the world as to how to make a basis of peace. Peace can come only by trust. As long as there is suspicion, there is going to be misunderstanding, and as long as there is misunderstanding, there is going to be trouble. If you can once get a situation of trust, then you have got a situation of permanent peace.

The address met with a warm reception in Latin America, a letter addressed to the President by the President of Salvador being particularly cordial in its praise. As a special evidence of the desire of the United States to provide for the needs of Mexico the American Government announced during the following month that arrangements had been made for the issuance of export licenses for the shipment to Mexico of considerable quantities of foodstuffs, railway equipment, iron and steel manufactures, cyanide and dynamite for mining purposes, as well as other goods, the exportation of which was carefully controlled by the United States due to the need therefor in connection with the prosecution of the war.

Shortly after the publication in the Mexican press of the President's address to the Mexican editors the Mexican Government made public, without consulting the American Government, Ambassador Fletcher's representations in regard to the Mexican oil decree, with an apparent desire to offset the effect in Mexico of the address. The American Government then made public the text of the note, with a statement that there was no disposition on the part of this Government to interfere with the internal affairs of Mexico, but that all that was desired was justice and fair dealing for its citizens who had made investments in Mexico. The note of protest, which was dated April 2, sets forth the nature of the controversy:

> The decree of the 19th of February, 1918, which was published in the *Diario Oficial* on the 27th of February last, establishing a tax on oil lands and on oil contracts executed prior to the 1st of May, 1917, etc., has been brought to the attention of my Government, and I am under instructions to state to Your Excellency that my Government has given most careful consideration to the effect which this decree, if carried into operation, will have upon American interests and property rights in Mexico. . . .
>
> While the United States Government is not disposed to request for its citizens exemption from the payment of their ordinary and just share of the burdens of taxation so long as the tax is uniform and not discriminatory in its operation, and can fairly be considered a tax and not a confiscation or unfair imposition, and while the United States Government is not inclined to interpose in behalf of its citizens in case of expropriation of private property for sound reasons of public welfare, and upon just compensation and by legal proceedings before tribunals, allowing fair and equal opportunity to be heard and giving due consideration to American rights, nevertheless the United States can not acquiesce in any procedure ostensibly or nominally in the form of taxation or the exercise of eminent domain, but really resulting in confiscation of private property and arbitrary deprivation of vested rights. . . .
>
> My Government is not in a position to state definitely that the operation of the aforementioned decree will, in effect, amount to confiscation of American interests. Nevertheless, it is deemed important that the Government of the United States should state at this time the real apprehension which it entertains as to the possible effect of this decree upon the vested rights of American citizens in oil properties in Mexico. The amount of taxes to be levied by this decree are in themselves a very great burden on the oil industry, and if they are not confiscatory in effect—and as to this my Government reserves opinion—they at least indicate a trend in that direction. It is represented to the State Department that the taxation borne by the oil fields of Mexico very greatly exceeds that imposed on the industry anywhere else in the world. Moreover, it would be possible under the terms of the decree, in view of the fact that the Mexican Government has not storage facilities for the taxes or royalties required to be paid in kind, by storing the same in the tanks of the operators, to monopolize such storage facilities to the point of the practical confiscation thereof until emptied by order of the Mexican Government or by the forced sale of the stored petroleum to the operators at extravagant rates.
>
> It is, however, to the principle involved in the apparent attempt at separation of surface and subsurface rights under this decree that my Government desires to direct special attention. It would appear that the decree in question is an effort to put into effect as to petroleum lands paragraph 4 of Article 27 of the constitution of May 1, 1917, by severing at one stroke the ownership of the petroleum deposits from the ownership of the surface, notwithstanding that the constitution provides that "private property shall not be expropriated except by reason of public utility and by means of indemnification." So far as my Government is aware, no provision has been made by Your Excellency's Government for just compensation for such arbitrary divestment of rights nor for the establishment of any tribunal invested with the functions of determining justly and fairly what indemnification is due to American interests. Moreover, there appears not the slightest indication that the separation of mineral rights from surface rights is a matter of public utility upon which the right of expropriation depends, according to the terms of the constitution itself. In the absence of the establishment of any procedure looking to the prevention of spoliation of American citizens and in the absence of any assurance, were such procedure established, that it would not uphold in defiance of international law and justice the arbitrary confiscations of Mexican authorities, it becomes the function of the Government of the United States most earnestly and respectfully to call the attention of the Mexican Government to the necessity which may arise to impel it to protect the property of its citizens in Mexico divested or injuriously affected by the decree above cited.
>
> The investments of American citizens in the oil properties in Mexico have been made in reliance upon the good faith and justice of the Mexican Government and Mexican laws, and my Government can not believe that the enlightened Government of a neighboring Republic at peace and at a stage in its progress when the development of its resources so greatly depends on its maintaining good faith with investors and operators, whom it has virtually invited to spend their wealth and energy within its borders, will disregard its clear and just obligations toward them.

A similar note was presented by the British representative at Mexico City, to which the Mexican Government replied that the decree was a matter of internal legislation passed in the exercise of sovereign rights, as to which representations on the part of foreign Governments were inadmissible, foreign investors believing they were injured thereby having their recourse to the Mexican courts. Further representations on the part of the American and British Governments, as well as direct negotiations conducted with the Mexican Government by a committee of the interested oil producers, are understood to have resulted in a modification of the attitude of the Mexican Government and of its decree of July 31.

Central America and the West Indies.—Efforts to obtain a renewal of the Convention of 1907 which established the Central American Court of Justice (*A. Y. B.*, 1917, p. 52) failed. The Court held its final session on March 15 after 10 years of activity.

At the request of the Guatemalan and Honduran Governments the United States in January, 1918, suggested to the two countries the appointment of special plenipotentiaries to proceed to the United States with a view to settling by agreement the boundary dispute between the two countries. The invitation was accepted and special missions were appointed which proceeded to the United States for the purpose.

In accord with the provisions of the compulsory military service bill passed in August, President Menocal, on Sept. 11, offered the United States a contingent of Cuban troops for service against the Central Powers. The proffer was declined, however, with regret and an expression of appreciation, on the ground that the plan for supplying, arming and equipping the constantly increasing American armies and those of the Allies would consume the output of American factories for some time to come and that virtually every ship had been assigned for months in advance to some vital war need, making a readjustment inadvisable. It was suggested that the Cuban army might continue, as in the past, to render valuable service in guarding the coast of the island until a change in conditions made possible the fulfillment of Cuba's desire to send soldiers to the firing line.

During the year Guatemala (April 21), Nicaragua (May 6), Haiti (July 12), and Honduras (July 19) declared war on Germany. Nicaragua also declared war on Austria-Hungary on May 6.

South America.—On Aug. 27, during the visit of the Uruguayan Minister of Foreign Affairs to the United States, a treaty was signed between the United States and Uruguay providing that only a single license fee may be collected from commercial travelers from either country traveling in the other; also that samples of commercial travelers of either country may enter the other without payment of duty when entered under bond that they will be reëxported within six months. The treaty, which followed the recommendation of the Pan-American Financial Conference held in Washington in May, 1915, was the first of a series of treaties of this character to be negotiated with all the Latin American states which are intended to simplify the complex and burdensome regulations, including provincial and local taxes, placed upon commercial travelers in many of the countries of Latin America.

There was signed on Sept. 6 by the U. S. Shipping Board and the Peruvian Government an agreement approved by the Peruvian Congress on the preceding day by which the German interned vessels taken over by Peru in June were chartered to the United States. Eight interned German steamers were also chartered to the U. S. Government by agreement between the Uruguayan Government and the U. S. Shipping Board entered into in July.

On Nov. 25 it was announced that as a consequence of anti-Peruvian riots at Iquique and Antofagasta, the Peruvian Government had withdrawn its consular officers from Chile and that the Chilean Government had taken similar action with reference to her consuls in Peru. The feeling between Chile and Peru has not been cordial since the war of 1879 between the two countries. The treaty of Ancon of Oct. 20, 1883, which ended the war, provided that the provinces of Tacna and Arica, which had been occupied by Chile during the war, should remain in her possession for a period of 10 years, after which time a plebiscite to be held in accordance with the provisions of a protocol, to be agreed upon and considered a portion of the treaty, was to decide their permanent possession. No protocol, however, was ratified by the two countries and the plebiscite was never held.

On Dec. 12 the Department of State

announced that the American diplomatic representatives at Santiago and Lima had, at the direction of the Acting Secretary of State, handed the Presidents of Chile and Peru a statement to the effect that the Government of the United States viewed the severance of consular relations between the two countries "with the greatest apprehension," particularly at this time when it is expected that the Peace Conference at Paris would take steps "to provide for an era of lasting peace among all peoples." The President of the United States in the statement drew the attention of the two Governments to the importance of taking "immediate steps to restrain popular agitation and to reëstablish" peaceful relations, and the Government of the United States indicated its readiness "to tender alone, or in conjunction with the other countries of this hemisphere, all possible assistance to bring about an equitable solution of the matter."

WAR AIMS AND PEACE OFFERS

Lloyd George's Speech of Jan. 5.—Speaking to the British Trade Union Conference, the British Premier on Jan. 5 made his most important statement of British war aims. The following extracts are significant:

It is not our wish or intention to question or destroy that position [Germany's world position] for the future, but rather to turn her aside from hopes and schemes of military domination.

Nor did we enter this war merely to alter or destroy the imperial constitution of Germany, much as we consider that military and autocratic constitution a dangerous anachronism in the twentieth century. Our point of view is that the adoption of a really democratic constitution by Germany would be the most convincing evidence that her old spirit of military domination has, indeed, died in this war and would make it much easier for us to conclude a broad, democratic peace with her. But, after all, that is a question for the German people to decide.

We are not fighting to destroy Austria-Hungary or to deprive Turkey of its capital or the rich lands of Asia Minor and Thrace which are predominantly Turkish. . . .

The first requirement, therefore, always put forward by the British Government and their allies, has been the complete restoration, political, territorial, and economic, of independence of Belgium and such reparation as can be made for the devastation of its towns and provinces.

This is no demand for a war indemnity, such as that imposed on France by Germany in 1871. It is not an attempt to shift the cost of warlike operations from one belligerent to another, which may or may not be defensible. . . .

We mean to stand by the French democracy to the death in the demand they make for a reconsideration of the great wrong of 1871, when, without any regard to the wishes of the population, two French provinces were torn from the side of France and incorporated in the German Empire. . . .

Outside of Europe we believe that the same principles should be applied. While we do not challenge the maintenance of the Turkish Empire in the homelands of the Turkish race with its capital at Constantinople, the passage between the Mediterranean and the Black Sea being internationalized and neutralized, Arabia, Armenia, Mesopotamia, Syria, and Palestine are, in our judgment, entitled to a recognition of their separate national conditions. . . .

With regard to the German colonies, I have repeatedly declared that they are held at the disposal of a conference whose decision must have primary regard to the wishes and interests of the native inhabitants of such colonies. None of those territories are inhabited by Europeans. The governing consideration, therefore, must be that the inhabitants should be placed under the control of an administration acceptable to themselves, one of whose main purposes will be to prevent their exploitation for the benefit of European capitalists or Governments.

The natives live in their various tribal organizations under chiefs and councils who are competent to consult and speak for their tribes and members and thus to represent their wishes and interests in regard to their disposal. The general principle of national self-determination is, therefore, as applicable in their cases as in those of the occupied European territories.

Declaring also for the restoration of Serbia, Montenegro and the occupied portions of France, Italy and Rumania, "genuine self-government on true democratic principles" for "those Austro-Hungarian nationalities who have long desired it," the "legitimate claims" of Italians and Rumanians in Austria-Hungary for union with Italy and Rumania, he laid down three conditions to be fulfilled before a lasting peace could be secured:

First, the sanctity of treaties must be reëstablished; secondly, a territorial settlement must be secured, based on the right of self-determination or the consent of the governed; and, lastly, we must seek, by the creation of some international organization, to limit the burden of armaments and diminish the probability of war.

President Wilson's Fourteen Points.—In an address to Congress on Jan. 8, President Wilson, who during the year assumed even more than during the prior year the *rôle* of spokesman for the Governments associated in the war against Germany, laid down 14 principles or bases for a programme of world peace:

I.—Open covenants of peace, openly arrived at, after which there shall be no private international understandings of any kind but diplomacy shall proceed always frankly and in the public view.

II.—Absolute freedom of navigation upon the seas, outside territorial waters, alike in peace and in war, except as the seas may be closed in whole or in part by international action for the enforcement of international covenants.

III.—The removal, so far as possible, of all economic barriers and the establishment of an equality of trade conditions among all the nations consenting to the peace and associating themselves for its maintenance.

IV.—Adequate guarantees given and taken that national armaments will reduce to the lowest point consistent with domestic safety.

V.—Free, open-minded, and absolutely impartial adjustment of all colonial claims, based upon a strict observance of the principle that in determining all such questions of sovereignty the interests of the population concerned must have equal weight with the equitable claims of the Government whose title is to be determined.

VI.—The evacuation of all Russian territory and such a settlement of all questions affecting Russia as will secure the best and freest coöperation of the other nations of the world in obtaining for her an unhampered and unembarrassed opportunity for the independent determination of her own political development and national policy, and assure her of a sincere welcome into the society of free nations under institutions of her own choosing; and, more than a welcome, assistance also of every kind that she may need and may herself desire. The treatment accorded Russia by her sister nations in the months to come will be the acid test of their goodwill, of their comprehension of her needs as distinguished from their own interests.

VII.—Belgium, the whole world will agree, must be evacuated and restored, without any attempt to limit the sovereignty which she enjoys in common with all other free nations. No other single act will serve as this will serve to restore confidence among the nations in the laws which they have themselves set and determined for the government of their relations with one another. Without this healing act the whole structure and validity of international law is forever impaired.

VIII.—All French territory should be freed and the invaded portions restored, and the wrong done to France by Prussia in 1871 in the matter of Alsace-Lorraine, which has unsettled the peace of the world for nearly fifty years, should be righted, in order that peace may once more be made secure in the interest of all.

IX.—A readjustment of the frontiers of Italy should be effected along clearly recognizable lines of nationality.

X.—The peoples of Austria-Hungary, whose place among the nations we wish to see safeguarded and assured, should be accorded the freest opportunity of autonomous development.

XI.—Rumania, Serbia, and Montenegro should be evacuated; occupied territories restored; Serbia accorded free and secure access to the sea; and the relations of the several Balkan States to one another determined by friendly counsel along historically established lines of allegiance and nationality; and international guarantees of the political and economic independence and territorial integrity of the several Balkan States should be entered into.

XII.—The Turkish portions of the present Ottoman Empire should be assured a secure sovereignty, but the other nationalities which are now under Turkish rule should be assured an undoubted security of life and an absolutely unmolested opportunity of autonomous development, and the Dardanelles should be permanently opened as a free passage to the ships and commerce of all nations under national guarantees.

XIII.—An independent Polish State should be erected which should include the territories inhabited by indisputably Polish populations, which should be assured a free and secure access to the sea, and whose political and economic independence and territorial integrity should be guaranteed by international covenant.

XIV.—A general association of nations must be formed under specific covenants for the purpose of affording mutual guarantees of political independence and territorial integrity to great and small States alike.

Replies of the Spokesmen of the Central Powers and Rejoinders.—On Jan. 24 Chancellor von Hertling in an address to the Reichstag, and Count von Czernin, the Austro-Hungarian Minister of Foreign Affairs, in an address to the Austrian delegations in the Reichsrath, replied to Lloyd George's and President Wilson's speeches, dealing *seriatim* with the 14 points of the latter. In substance the two replies were similar, although Count Czernin's speech was more moderate in tone and in spite of his refusal of "the suggestions as to the manner in which Austria and Hungary should manage their internal administration," contained a query whether "an exchange of ideas between the two Powers [Austria-Hungary and the United States] could not be the point of departure for a personal conversation among all states which have not yet joined in peace negotiations."

The substance of Count Hertling's replies to the 14 points of the President were thus summarized in the latter's address to Congress of February 11:

> He agrees that the seas should be free, but looks askance at any limitation to that freedom by international action in the interest of the common order. He would without reserve be glad to see economic barriers removed between nation and nation, for that could in no way impede the ambitions of the military party, with whom he seems constrained to keep on terms. Neither does he raise objection to a limitation of armaments. That matter will be settled of itself, he thinks, by the economic conditions which must follow the war. But the German colonies, he demands, must be returned without debate. He will discuss with no one but the representatives of Russia what disposition shall be made of the peoples and the lands of the Baltic provinces; with no one but the Government of France the "conditions" under which French territory shall be evacuated; and only with Austria what shall be done with Poland.
>
> In the determination of all questions affecting the Balkan States he defers, as I understand him, to Austria and Turkey; and with regard to the agreements to be entered into concerning the non-Turkish peoples of the present Ottoman Empire, to the Turkish authorities themselves. After a settlement all around, effected in this fashion, by individual barter and concession, he would have no objection, if I correctly interpret his statement, to a league of nations which would undertake to hold the new balance of power steady against external disturbance.

The President in this speech, Lloyd George in a speech in the House of Commons on the following day, and the Supreme War Council at Versailles in a statement of Feb. 3 all agreed that the replies of Hertling and Czernin were inacceptable.

In his address of Feb. 11 the President laid down the following four principles as the foundation for a just peace:

> *First.*—That each part of the final settlement must be based upon the essential justice of that particular case and upon such adjustments as are most likely to bring a peace that will be permanent.
>
> *Second.*—That peoples and provinces are not to be bartered about from sovereignty to sovereignty as if they were mere chattels and pawns in a game, even the great game, now forever discredited, of the balance of power; but that,
>
> *Third.*—Every territorial settlement involved in this war must be made in the interest and for the benefit of the populations concerned, and not as a part of any mere adjustment or compromise of claims among rival States; and,
>
> *Fourth.*—That all well-defined national aspirations shall be accorded the utmost satisfaction that can be accorded them without introducing new or perpetuating old elements of discord and antagonism that would be likely in time to break the peace of Europe, and consequently of the world.

In a counter reply to this address Count Hertling in a speech before the Reichstag delivered on Feb. 25 indicated his agreement with these four principles, although adding that similar principles should be enunciated by the other states at war with the Central Powers. The insincerity of his acceptance of these principles was, however, manifest from their inconsistency with the German course toward Russia (see *supra*), to which the Chancellor made extended reference in his address. The speech, which insisted that Alsace-Lorraine was a purely German question and offered no concessions with reference to Austrian and Turkish subject nationalities, expressed a belief in the advantages of "discussion in an intimate gathering" as likely to "lead to understanding on many individual questions which can really be settled only by compromise."

This reply of the German Chancellor was pronounced unsatisfactory by the British Secretary of Foreign Affairs in the course of a discussion in the House of Commons on Feb. 27, although in a letter dated March 5 Lord Lansdowne, whose previous letter on the subject of peace was noted in the YEAR BOOK for 1917 (p. 70), apparently found in Count Hertling's speech, which he admitted was not entirely satisfactory, sufficient concessions to justify further discussion and possibly such an "intimate gathering" of "persons authorized to discuss confidentially and without prejudice the possibility of a more formal conference," as was suggested by Count Hertling.

Separate Peace Offers.—A statement of Count Czernin on April 2 brought forth the publication by the French Government of the text of a letter addressed during 1917 by Emperor Karl of Austria to his brother-in-law, Prince Sixtus de Bourbon, who was fighting in the Allied armies, which contained the following passages:

> I beg you to convey privately and unofficially to President Poincaré that I will support by every means, and by exerting all my personal influence with my allies, France's just claims regarding Alsace-Lorraine.
>
> Belgium should be entirely reëstablished in her sovereignty, retaining entirely her African possessions without prejudice to the compensations she should receive for the losses she has undergone.
>
> Serbia should be reëstablished in her sovereignty and, as a pledge of our goodwill, we are ready to assure her equitable natural access to the Adriatic, and also wide economic concessions in Austria-Hungary. . . .
>
> Having thus laid my ideas clearly before you, I would ask you in turn, after consulting with these two powers, to lay before me the opinion first of France and England, with a view thus to preparing the ground for an understanding on the basis of which official preliminary negotiations could be taken up and reach a result satisfactory to all.

It developed that this letter had been communicated to the sovereigns and premiers of Great Britain and Italy and had been rejected as insincere, apparently after a request for supplementary explanations had been made and a second letter received. Count Czernin denied the correctness of the text as published and stated that it was a private letter not meant for communication to the Entente and that Kaiser Karl had said that he would have supported France's claims to Alsace-Lorraine, had they been just but they were not. He never, however, made public any complete text of the letter as he claimed it was written.

There followed shortly upon this disclosure a series of conferences between the German and Austro-Hungarian rulers and their premiers with the evident view of tightening the military and economic bonds of the alliance upon Austria. Statements were issued by the powers concerned to the effect that as a result of the conferences an agreement for closer military coöperation had been reached.

Among the other interesting disclosures of the year was a memorandum prepared by Prince Lichnowsky, German Ambassador at London at the outbreak of the war, and intended for private circulation, which detailed at length the efforts of the British Government to arrive at a peaceful settlement of differences with Germany and told how his efforts along these lines were thwarted by the German Foreign Office. A statement prepared by von Jagow, Secretary for Foreign Affairs under Bethmann-Hollweg, intended to rebut the effect of the Lichnowsky memorandum, in fact confirmed its essential features.

On June 15 the Italian Premier announced in the Chamber of Deputies that the Central Powers had about the beginning of the month made overtures for a separate peace, which had been promptly rejected by the Italian Government.

Further Expression of War Aims.—On April 6 President Wilson, speaking in Baltimore, pointed out the inconsistency of the professions of the spokesmen of the Central Powers and the resort to force in Russia, Rumania, Finland, and the Ukraine, and concluded that only a similar resort to force on the part of the United States offered any hope of an eventual just peace. A further speech by Foreign Secretary von Kühlmann carried the discussion no further, although his statement that, "in view of the magnitude of this war and the number of powers, including those from overseas, that are engaged," its end could "hardly be expected through purely military decisions alone and without recourse to diplomatic negotiations" resulted in a storm of protest in the pan-German and militant press and brought about his resignation.

Speaking at the tomb of Washington at Mount Vernon on the Fourth of July, the President again laid down in unmistakable phrases "the ends for which the associated peoples of the world are fighting," upon which "there can be no compromise" and "which must be conceded them before there can be peace":

> I. The destruction of every arbitrary power anywhere that can separately, secretly, and of its single choice disturb the peace of the world; or, if it cannot be presently destroyed, at the least its reduction to virtual impotence.
>
> II. The settlement of every question, whether of territory, of sovereignty, of economic arrangement, or of political relationship, upon the basis of the free acceptance of that settlement by the people immediately concerned, and not upon the basis of the material interest or advantage of any other nation or people which may desire a different settlement for the sake of its own exterior influence or mastery.
>
> III. The consent of all nations to be governed in their conduct toward each other by the same principles of honor and of respect for the common law of civilized society that govern the individual citizens of all modern States in their relations with one another; to the end that all promises and covenants may be sacredly observed, no private plots or conspiracies hatched, no selfish injuries wrought with impunity, and a mutual trust established upon the handsome foundation of a mutual respect for right.
>
> IV. The establishment of an organization of peace which shall make it certain that the combined power of free nations will check every invasion of right and serve to make peace and justice the more secure by affording a definite tribunal of opinion to which all must submit and by which every international readjustment that cannot be amicably agreed upon by the peoples directly concerned shall be sanctioned.
>
> These great objects can be put into a single sentence. What we seek is the reign of law, based upon the consent of the governed and sustained by the organized opinion of mankind. These great ends cannot be achieved by debating and seeking to reconcile and accommodate what statesmen may wish, with their projects for balances of power and of national opportunity. They can be realized only by the determination of what the thinking peoples of the world desire, with their longing hope for justice and for social freedom and opportunity.

A speech of Chancellor von Hertling of July 11 before the main committee of the Reichstag and a note addressed to the Austrian and Hungarian Premiers by Baron Burian, who had succeeded Count Czernin as Austro-Hungarian Minister of Foreign Affairs after the publication of the letter to Prince Sixtus, were along the line of previous utterances. Although von Hertling stated that "as soon as a serious desire for peace manifests itself on the other side we must follow it up"—a standpoint which he stated was "shared emphatically by the chief of the army administration"—no modification was indicated in his ideas of a basis for such a peace. He stated that although it never was the intention of the German Government to keep Belgium "except as a pledge to secure Germany against future perils and until the danger is removed," the pledge could not be surrendered, intimating further that certain military and economic guarantees were required before Belgium would be freed. Baron Burian's efforts to put a conciliatory aspect upon the attitude of the Central Powers halted before the problem of the Austro-Hungarian subject races, which to him was a concern of Austria-Hungary alone. "We are prepared to discuss anything except our own territory."

Austrian Proposal for Secret, Unbinding Discussion.—On Sep. 15 it was announced that the Austro-Hungarian Government had forwarded to the various belligerents

> a proposal shortly to send to a neutral country, upon a previous agreement as to the date and place, delegates who would broach a confidential nonbinding conversation over the fundamental principles of a peace that could be concluded. The delegates would be commissioned to communicate to one another the views of their respective Governments on the aforesaid principles and very freely and frankly interchange information on every point for which provision should be made.

It was indicated that there would be no interruption of military activities during the discussion. As the telegraphic text of the note preceded the formal note presented by the Swedish Minister, in charge of Austro-Hungarian interests, President Wilson had his reply ready when the note was delivered at the State Department. The reply was simplicity itself:

> The Government of the United States feels that there is only one reply which it can make to the suggestion of the Imperial Austro-Hungarian Government. It has repeatedly and with entire candor stated the terms upon which the United States would consider peace and can and will entertain no proposal for a conference upon a matter concerning which it has made its position and purpose so plain.

Premier Clemenceau and Foreign Secretary Balfour also indicated the declination of the proposals by their Governments.

At the same time as the Austrian note was given to the press, it was announced that Germany had proposed peace to Belgium on the following terms:

> That Belgium shall remain neutral until the end of the war.
>
> That thereafter the entire economic and political independence of Belgium shall be reconstituted.
>
> That the pre-war commercial treaties between Germany and Belgium shall again be put into operation after the war for an indefinite period.
>
> That Belgium shall use her good offices to secure the return of the German colonies.
>
> That the Flemish question shall be considered, and the Flemish minority, which aided the German invaders, shall not be penalized.

It developed, however, that the proposal had been made by Germany some time before and had been rejected by the Belgian Government after consultation with its allies.

President Wilson's Address of Sept. 27.—On Sept. 7, speaking in New York, President Wilson again outlined the war aims of the peoples associated against the German Government and its allies. The following passages of his address are especially noteworthy, setting forth the lofty purposes to be achieved by the war:

> At every turn of the war we gain a fresh consciousness of what we mean to accomplish by it. . . . For it has positive and well defined purposes which we did not determine and which we cannot alter. No statesman or assembly created them; no statesman or assembly can alter them. They have arisen out of the very nature and circumstances of the war. The most that statesmen or assemblies can do is to carry them out or be false to them. They were perhaps not clear at the outset; but they are clear now. The war has lasted more than four years and the whole world has been drawn into it. The common will of mankind has been substituted for the particular purposes of individual states. Individual statesmen may have started the conflict, but neither they nor their opponents can stop it as they please. It has become a people's war, and peoples of all sorts and races, of every degree of power and variety of fortune, are involved in its sweeping processes of change and settlement. . . .
>
> We accepted the issues of the war as facts, not as any group of men either here or elsewhere had defined them, and we can accept no outcome which does not squarely meet and settle them. Those issues are these:
>
> Shall the military power of any nation or group of nations be suffered to determine the fortunes of peoples over whom they have no right to rule except the right of force?
>
> Shall strong nations be free to wrong weak nations and make them subject to their purpose and interest?
>
> Shall peoples be ruled and dominated, even in their own internal affairs, by arbitrary and irresponsible force or by their own will and choice?
>
> Shall there be a common standard of right and privilege for all peoples and nations or shall the strong do as they will and the weak suffer without redress?
>
> Shall the assertion of right be haphazard and by casual alliance, or shall there be a common concert to oblige the observance of common rights? . . .
>
> We are all agreed that there can be no peace obtained by any kind of bargain or compromise with the Governments of the Central Empires, because we have dealt with them already and have seen them deal with other Governments that were parties to this struggle, at Brest-Litovsk and Bucharest. They have convinced us that they are without honor and do not intend justice. They observe no covenants, accept no principle but force and their own interest. We cannot "come to terms" with them. They have made it impossible. The German people must by this time be fully aware that we cannot accept the word of those who forced this war upon us. We do not think the same thoughts or speak the same language of agreement. . . .
>
> If it be in deed and in truth the common object of the Governments associated against Germany and of the nations whom they govern, as I believe it to be, to achieve by the coming settlements a secure and lasting peace, it will be necessary that all who sit down at the peace table shall come ready and willing to pay the price, the only price, that will procure it; and ready and willing, also, to create in some virile fashion the only instrumentality by which it can be made certain that the agreements of the peace will be honoured and fulfilled.
>
> That price is impartial justice in every item of the settlement, no matter whose interest is crossed; and not only impartial justice but also the satisfaction of the several peoples whose fortunes are dealt with. That indispensable instrumentality is a League of Nations formed under covenants that will be efficacious. Without such an instrumentality, by which the peace of the world can be guaranteed, peace will rest in part upon the word of outlaws and only upon that word. For Germany will have to redeem her character, not by what happens at the peace table but by what follows.
>
> And, as I see it, the constitution of that League of Nations and the clear definition of its objects must be a part, is in a sense the most essential part, of the peace settlement itself. It cannot be formed now. If formed now, it

> would be merely a new alliance confined to the nations associated against a common enemy. It is not likely that it could be formed after the settlement. . . .
>
> But these general terms do not disclose the whole matter. Some details are needed to make them sound less like a thesis and more like a practical programme. These, then, are some of the particulars, and I state them with the greater confidence because I can state them authoritatively as representing this Government's interpretation of its own duty with regard to peace:
>
> First, the impartial justice meted out must involve no discrimination between those to whom we wish to be just and those to whom we do not wish to be just. It must be a justice that plays no favorites and knows no standard but the equal rights of the several peoples concerned:
>
> Second, no special or separate interest of any single nation or any group of nations can be made the basis of any part of the settlement which is not consistent with the common interest of all;
>
> Third, there can be no leagues or alliances or special covenants and understandings within the general and common family of the League of Nations;
>
> Fourth, and more specifically, there can be no special, selfish economic combinations within the League and no employment of any form of economic boycott or exclusion except as the power of economic penalty by exclusion from the markets of the world may be vested in the League of Nations itself as a means of discipline and control;
>
> Fifth, all international agreements and treaties of every kind must be made known in their entirety to the rest of the world. . . .
>
> In the same sentence in which I say that the United States will enter into no special arrangements or understandings with particular nations let me say also that the United States is prepared to assume its full share of responsibility for the maintenance of the common covenants and understandings upon which peace must henceforth rest. We still read Washington's immortal warning against "entangling alliances" with full comprehension and an answering purpose. But only special and limited alliances entangle; and we recognize and accept the duty of a new day in which we are permitted to hope for a general alliance which will avoid entanglements and clear the air of the world for common understandings and the maintenance of common rights.

Armistice with Bulgaria.—Simultaneously with the invasion of Bulgarian territory by the allied troops in their advance in Macedonia (see III, *The European War*), Gen. Franchet d'Esperey, in command of the Allied forces operating from Saloniki, announced on Sept. 27 that he had received a proposal from the Bulgarian Government that military operations be suspended until the negotiation of an armistice. Pending the discussion of the Bulgarian proposal by the Allied powers, General d'Esperey said that military operations would not be stopped but that he would receive the Bulgarian representatives. The latter reached Saloniki on Sept. 28 and the following day an armistice was signed. The terms of the armistice, which was purely military in character, were reported to be the evacuation of Serbia and all other occupied territory, the demobilization of the Bulgarian Army except three divisions of infantry and four regiments of cavalry, the consignment to the Allies of the arms, munitions, and war materials of the demobilized troops, the reëstablishment of Bulgarian rule in Bulgarian territory occupied by the troops of the Entente, capitulation of the Bulgarian units stationed west of Uskub at the time of the signing of the armistice, and the departure within a month of German and Austro-Hungarian troops, military agencies, diplomatic and consular representatives and other persons. The final territorial settlement was left for disposition at the general peace conference. On Oct. 10 the German Minister left Sofia, after turning over German interests to the Dutch diplomatic representative.

Peace Offer of the Central Powers.—In the coalition government headed by Prince Maximilian of Baden, who succeeded Count Hertling as Imperial Chancellor, representatives of the majority Socialist Party, of the "progressive" party and of the liberal wing of the Center Party, took office (see III, *Germany*). One of the first acts of Prince Maximilian after his assumption of the Chancellorship was to despatch on the night of Oct. 4 a note to the American Government requesting President Wilson "to take steps for the restoration of peace, to notify all belligerents of this request, and to invite them to delegate plenipotentiaries for the purpose of taking up negotiations." In making this request the Chancellor stated that the German Government "accepts as a basis for peace negotiations the programme laid down by the President of the United States in his message to Congress of Jan. 8, 1918, and in his later pronouncements, especially in his address of Sept. 27, 1918," adding that "in order to avoid further bloodshed, the German Government requests the President to bring about the immediate conclusion of an armistice on land, on water and in the air."

In an address to the Reichstag on Oct. 5 announcing that he had taken this step, Prince Maximilian made *inter alia* the following statements:

> The programme of the majority parties upon which I take my stand contains, first, an acceptance of the answer of the former Imperial Government to Pope Benedict's note of Aug. 1, 1916, and an unconditional acceptance of the Reichstag resolution of July 19, the same year. It further declares willingness to join a general league of nations based on the foundation of equal rights for all, both strong and weak.
>
> It considers this solution of the Belgian question to lie in the complete rehabilitation (*Wiederherstellung*) of Belgium, particularly of its independence and territorial integrity. An effort shall also be made to reach an understanding on the question of indemnity.
>
> The programme will not permit the peace treaties hitherto concluded to be a hindrance to the conclusion of a general peace.
>
> Its particular aim is that popular representative bodies shall be formed immediately on a broad basis in the Baltic provinces in Lithuania and Poland. We will promote the realization of necessary preliminary conditions therefor without delay by the introduction of civilian rule. All these lands shall regulate their constitutions and their relations with neighboring peoples without external interference.
>
> In the matter of international policies I have taken a clear stand through the manner in which the formation of the Government was brought about. Upon my motion, leaders of the majority parties were summoned for direct advice. It was my conviction, gentlemen, that unity of Imperial leadership should be assured not only through mere schismatic party allegiance, by the different members of the Government. I considered almost still more important the unity of ideas. I proceeded from this viewpoint and have, in making my selections, laid greatest weight on the fact that the members of the new Imperial Government stand on a basis of a just peace of justice, regardless of the war situation, and that they have openly declared this to be their standpoint at the time when we stood at the height of our military successes.
>
> I am convinced that the manner in which imperial leadership is now constituted with coöperation of the Reichstag is not something ephemeral, and that when peace comes a Government cannot again be formed which does not find support in the Reichstag and does not draw its leaders therefrom. . . .
>
> I have taken this step . . . because I believe the thoughts regarding the future wellbeing of the nation which were proclaimed by Mr. Wilson are in accord with the general ideas cherished by the new German government and with it the overwhelming majority of our people.

It was announced that a note similar to the German Chancellor's was received by the United States from the Austro-Hungarian Government, and some days later, on Oct. 14, a note to the same effect was received from the Turkish Government.

To the Chancellor's note the following preliminary reply was sent by the American Secretary of State under instructions of the President:

> Before making reply to the request of the Imperial German Government, and in order that reply shall be as candid and straightforward as the momentous interests involved require, the President of the United States deems it necessary to assure himself of the exact meaning of the note of the Imperial Chancellor. Does the Imperial Chancellor mean that the Imperial German Government accepts the terms laid down by the President in his address to the Congress of the United States on the 8th of January last, and in subsequent addresses, and that its object in entering into discussions would be only to agree upon the practical details of their application?
>
> The President feels bound to say, with regard to the suggestions of an armistice, that he would not feel at liberty to propose a cessation of arms to the Governments with which the Government of the United States is associated against the Central Powers, so long as the armies of those Powers are upon their soil. The good faith of any discussion would manifestly depend upon the consent of the Central Powers immediately to withdraw their forces everywhere from invaded territory.
>
> The President also feels that he is justified in asking whether the Imperial Chancellor is speaking merely for the constituted authorities of the Empire, who have so far conducted the war. He deems the answer to these questions vital from every point of view.

To this inquiry Dr. Solf, the newly appointed German Minister of Foreign Affairs, replied on Oct. 12:

> The German Government has accepted the terms laid down by President Wilson in his address of January the 8th and in his subsequent addresses as the foundations of a permanent peace of justice. Consequently, its object in entering into discussions would be only to agree upon practical details of the application of these terms.
>
> The German Government believes that

> the Governments of the powers associated with the United States also accept the position taken by President Wilson in his addresses.
>
> The German Government in accordance with the Austro-Hungarian Government for the purpose of bringing about an armistice declares itself ready to comply with the propositions of the President in regard to evacuation.
>
> The German Government suggests that the President may occasion the meeting of a mixed commission for making the necessary arrangements concerning the evacuation.
>
> The present German Government which has undertaken the responsibility for this step towards peace has been formed by conferences and in agreement with the great majority of the Reichstag. The Chancellor, supported in all of his actions by the will of this majority, speaks in the name of the German Government and of the German people.

The reply of Secretary Lansing dated Oct. 14 was as follows:

> The unqualified acceptance by the present German Government, and by a large majority of the Reichstag, of the terms laid down by the President of the United States of America in his address to the Congress of the United States on the 8th of January, 1918, and in his subsequent addresses, justified the President in making a frank and direct statement of his decision with regard to the communications of the German Government on the 8th and 12th of October, 1918.
>
> It must be clearly understood that the process of evacuation and the conditions of an armistice are matters which must be left to the judgment and advice of the military advisers of the Government of the United States and the Allied Governments, and the President feels it his duty to say that no arrangement can be accepted by the Government of the United States which does not provide absolutely satisfactory safeguards and guarantees of the maintenance of the present military supremacy of the armies of the United States and the Allies in the field. He feels confident that he can safely assume that this will also be the judgment and decision of the Allied Governments. . . .
>
> It is necessary, also, in order that there may be no possibility of misunderstanding, that the President should very solemnly call the attention of the Government of Germany to the language and plain intent of one of the terms of peace which the German Government has now accepted. It is contained in the address of the President delivered at Mount Vernon on the Fourth of July last.
>
> It is as follows: "The destruction of every arbitrary power anywhere that can separately, secretly and of its single choice, disturb the peace of the world; or, if it cannot be presently destroyed, at least its reduction to virtual impotency."
>
> The power which has hitherto controlled the German nation is of the sort here described. It is within the choice of the German nation to alter it. The President's words just quoted naturally constitute a condition precedent to peace, if peace is to come by the action of the German people themselves. The President feels bound to say that the whole process of peace will, in his judgment, depend upon the definiteness and the satisfactory character of the guarantees which can be given in this fundamental matter. It is indispensable that the Governments associated against Germany should know beyond a peradventure with whom they are dealing. . . .

On Oct. 16 it was announced that the Bundesrat, or upper house of the German Parliament, had accepted proposed amendments requiring the consent of the Reichstag to a declaration of war, except where German territory had been previously invaded or the coasts of Germany attacked, as well as to "treaties of peace and reaties with foreign states which deal with affairs coming under the competence of the Imperial law-making bodies." It was also stated that the Kaiser had decreed that in future martial law could only be administered by an agreement of the civil and military authorities, the final reference in case of disagreement being to the Imperial Chancellor or a representative appointed by him.

To Secretary Lansing's note of Oct. 14 the German Government replied under date of Oct. 20:

> In accepting the proposal for an evacuation of the occupied territories the German Government has started from the assumption that the procedure of this evacuation and of the conditions of an armistice should be left to the judgment of the military advisers and that the actual standard of power on both sides in the field has to form the basis for arrangements safeguarding and guaranteeing this standard. The German Government suggests to the President to bring about an opportunity for fixing the details. It trusts that the President of the United States will approve of no demand which would be irreconcilable with the honor of the German people and with opening a way to a peace of justice. . . .
>
> As the fundamental conditions for peace, the President characterizes the destruction of every arbitrary power that can separately, secretly and of its own single choice disturb the peace of the world. To this the German Government replies: Hitherto the representation of the people in the German Empire has not been endowed with an influence on the formation of the Government. The Constitution did not provide for a concurrence of the represen-

tation of the people in decision on peace and war. These conditions have just now undergone a fundamental change. The new government has been formed in complete accord with the wishes of the representation of the people, based on the equal, universal, secret, direct franchise. The leaders of the great parties of the Reichstag are members of this government. In future no government can take or continue in office without possessing the confidence of the majority of the Reichstag. The responsibility of the Chancellor of the Empire to the representation of the people is being legally developed and safeguarded. The first act of the new government has been to lay before the Reichstag a bill to alter the Constitution of the Empire so that the consent of the representation of the people is required for decisions on war and peace. The permanence of the new system is, however, guaranteed not only by constitutional safeguards, but also by the unshakable determination of the German people, whose vast majority stands behind these reforms and demands their energetic continuance.

The question of the President, with whom he and the Governments associated against Germany are dealing, is therefore answered in a clear and unequivocal manner by the statement that the offer of peace and an armistice has come from a government which, free from arbitrary and irresponsible influence, is supported by the approval of the overwhelming majority of the German people.

On Oct. 23 the Secretary of State transmitted the President's reply, which stated that, in view of the assurances of the German Government,

the President of the United States feels that he cannot decline to take up with the Governments with which the Government of the United States is associated the question of an armistice.

He deems it his duty to say again, however, that the only armistice he would feel justified in submitting for consideration would be one which should leave the United States and the powers associated with her in a position to enforce any arrangements that may be entered into and to make a renewal of hostilities on the part of Germany impossible. . . . Should such terms of armistice be suggested, their acceptance by Germany will afford the best concrete evidence of her unequivocal acceptance of the terms and principles of peace from which the whole action proceeds.

The President would deem himself lacking in candor did he not point out in the frankest possible terms the reason why extraordinary safeguards must be demanded. Significant and important as the constitutional changes seem to be which are spoken of by the German Foreign Secretary in his note of the 20th of October, it does not appear that the principle of a Government responsible to the German people has yet been fully worked out or that any guarantees either exist or are in contemplation that the alterations of principle and of practice now partially agreed upon will be permanent. Moreover, it does not appear that the heart of the present difficulty has been reached. It may be that future wars have been brought under the control of the German people, but the present war has not been; and it is with the present war that we are dealing. It is evident that the German people have no means of commanding the acquiescence of the military authorities of the Empire in the popular will; that the power of the King of Prussia to control the policy of the Empire is unimpaired; that the determining initiative still remains with those who have hitherto been the masters of Germany.

Feeling that the whole peace of the world depends now on plain speaking and straightforward action, the President deems it his duty to say, without any attempt to soften what may seem harsh words, that the nations of the world do not, and cannot, trust the word of those who have hitherto been the masters of German policy, and to point out once more that in concluding peace and attempting to undo the infinite injuries and injustices of this war the Government of the United States cannot deal with any but veritable representatives of the German people who have been assured of a genuine constitutional standing as the real rulers of Germany. If it must deal with the military masters and the monarchical autocrats of Germany now, or if it is likely to have to deal with them later in regard to the international obligations of the German Empire, it must demand, not peace negotiations, but surrender. Nothing can be gained by leaving this essential thing unsaid.

To this the German Government replied on Oct. 27:

The German Government has taken cognizance of the reply of the President of the United States. The President knows the far-reaching changes which have taken place and are being carried out in the German constitutional structure. The peace negotiations are being conducted by a government of the people, in whose hands rests, both actually and constitutionally, the authority to make decisions. The military powers are also subject to this authority. The German Government now awaits the proposals for an armistice, which is the first step toward a peace of justice, as described by the President in his pronouncements.

Simultaneous reports from Germany indicated the adoption on Oct. 26 by a large majority of the Reichstag of an amendment to the Imperial Constitution by which the military authorities were placed under the control of the civil government. On Oct. 28 the Kaiser, demands for whose abdication had already assumed considerable proportions in Germany (see III, *Germany*), issued a decree approving the recent decisions of the Reichstag.

Meanwhile disintegrating tendencies in Austria-Hungary were receiving a great impetus (see III, *Austria-Hungary*). The separatist movement gained great force not only in Bohemia and the Slavic districts in the north and the south of the Empire but even in Hungary, where it was the subject of heated discussions in the Hungarian Parliament. Baron Burian in a statement to the Committee of Foreign Affairs of the Hungarian delegation at Vienna, reported Oct. 16, admitted that "we cannot hope any longer for a decisive success by arms," adding that "our confidence in President Wilson's word is so firm that we categorically reject suppositions attributing to his procedure motives, tactical reasons or intentions malevolent toward the monarchy," and that the demand for the evacuation of occupied territory before granting an armistice was "perfectly just and founded not only on political reasons but on positive military reasons."

On Oct. 18 the Austrian Emperor in a manifesto to the people said:

> Austria must become, in conformity with the will of its people, a confederate State, in which each nationality shall form on the territory which it occupies its own local autonomy.
>
> This does not mean that we are already envisaging the union of the Polish territories of Austria with the independent Polish State.
>
> The city of Trieste, with all its surroundings, shall, in conformity with the desire of its population, be treated separately.

It was stated that four component states, the German-Austrian, Czecho-Slovak, Illyrian and Ruthenian, would be formed with a common head, common foreign representation, and a common defence.

On Oct. 19 the President's reply to the Austro-Hungarian Government's peace note was handed to the Swedish Minister, in charge of Austro-Hungarian interests:

> The President deems it his duty to say to the Austro-Hungarian Government that he cannot entertain the present suggestions of that Government because of certain events of utmost importance which, occurring since the delivery of his address of the 8th of January last, have necessarily altered the attitude and responsibility of the Government of the United States. Among the 14 terms of peace which the President formulated at that time occurred the following:
>
> > "The people of Austro-Hungary, whose place among the nations we wish to see safeguarded and assured, should be accorded the freest opportunity of autonomous development."
>
> Since that sentence was written and uttered to the Congress of the United States, the Government of the United States has recognized that a state of belligerency exists between the Czecho-Slovaks and the German and Austro-Hungarian Empires, and that the Czecho-Slovak National Council is a *de facto* belligerent Government clothed with proper authority to direct the military and political affairs of the Czecho-Slovaks. It has also recognized in the fullest manner the justice of the nationalistic aspirations of the Jugo-Slavs for freedom.
>
> The President is, therefore, no longer at liberty to accept the mere "autonomy" of these peoples as a basis of peace, but is obliged to insist that they, and not he, shall be the judges of what action on the part of the Austro-Hungarian Government will satisfy their aspirations and their conception of their rights and destiny as members of the family of nations.

After Count Andrassy had succeeded to the post of Austro-Hungarian Minister of Foreign Affairs the Austro-Hungarian Government replied (Oct. 28) to the American note

> that equally with the preceding proclamation of the President, it adheres also to the same point of view contained in the last note upon the rights of the Austro-Hungarian peoples, especially those of the Czecho-Slovaks and the Jugo-Slavs.
>
> Consequently Austria-Hungary, accepting all the conditions the President has laid down for the entry into negotiations for an armistice and peace, no obstacle exists, according to the judgment of the Austro-Hungarian Government to the beginning of these negotiations.
>
> The Austro-Hungarian Government declares itself ready, in consequence, without awaiting the result of other negotiations to enter into negotiations upon peace between Austria-Hungary and the States in the opposing group and for an immediate armistice upon all Austro-Hungarian fronts.
>
> It asks President Wilson to be so kind as to begin overtures on this subject.

On Oct. 30 it was announced that Count Andrassy had followed his note with another addressed to Secretary Lansing:

> Immediately after having taken direction of the Ministry of Foreign Affairs, and after the despatch of the official answer to your note of October 18, 1918, by which you were able to see that we accept all the points and principles laid down by President Wilson in his various declarations, and are in complete accord with the efforts of President Wilson to prevent future wars and to create a league of nations, we have taken preparatory measures, in order that Austrians and Hungarians may be able, according to their own desire, and without being in any way hindered, to make a decision as to their future organization and to rule it.
>
> Since the accession to power of Emperor-King Charles his immovable purpose has been to bring an end to the war. More than ever this is the desire of the sovereign of all the Austro-Hungarian peoples, who acknowledge that their future destiny can only be accomplished in a pacific world, by being freed from all disturbances, privations and sorrows of war.
>
> This is why I address you directly, Mr. Secretary of State, praying that you will have the goodness to intervene with the President of the United States in order that in the interest of humanity, as in the interest of all those who live in Austria-Hungary, an immediate armistice may be concluded on all fronts and for an overture that immediate negotiations for peace will follow.

A further note received from the German Government outlining its claims of internal reform and democratization was not made public by the Department of State.

The Secretary of State on Oct. 31 informed the Spanish Ambassador in charge of Turkish interests that the request of the Turkish Government for an armistice had been brought to the knowledge of the Governments at war with Turkey. Similar reference is understood to have been made in the case of the notes of the Austro-Hungarian Government.

Armistice with Turkey.—In the latter part of October the Turkish authorities released General Townshend, the British commander captured at Kut-el-Amara, so that he might inform the British admiral in command in the Aegean that the Turkish Government requested that negotiations for an armistice be opened immediately. The British admiral indicated his willingness to receive properly accredited plenipotentiaries and inform them of the conditions upon which the Allies would agree to a cessation of hostilities. As a result an armistice between the Allies and Turkey was signed on Oct. 31 at Mudros on the island of Lemnos, the terms of which were as follows:

> *First.*—The opening of the Dardanelles and the Bosphorus and access to the Black Sea. Allied occupation of the Dardanelles and Bosphorus forts.
>
> *Second.*—The positions of all mine fields, torpedo tubes and other obstructions in Turkish waters are to be indicated, and assistance given to sweep or remove them, as may be required.
>
> *Third.*—All available information concerning mines in the Black Sea is to be communicated.
>
> *Fourth.*—All Allied prisoners of war and Armenian interned persons and prisoners are to be collected in Constantinople and handed over unconditionally to the Allies.
>
> *Fifth.*—Immediate demobilization of the Turkish Army, except such troops as are required for surveillance on the frontiers and for the maintenance of internal order. The number of effectives and their disposition to be determined later by the Allies after consultation with the Turkish Government.
>
> *Sixth.*—The surrender of all war vessels in Turkish waters or waters occupied by Turkey. These ships will be interned in such Turkish port or ports as may be directed, except such small vessels as are required for police and similar purposes in Turkish territorial waters.
>
> *Seventh.*—The Allies to have the right to occupy any strategic points in the event of any situation arising which threatens the security of the Allies.
>
> *Eighth.*—Free use by Allied ships of all ports and anchorages now in Turkish occupation and denial of their use by the enemy. Similar conditions are to apply to Turkish mercantile shipping in Turkish water for the purposes of trade and the demobilization of the army.
>
> *Ninth.*—Allied occupation of the Taurus tunnel system.
>
> *Tenth.*—Immediate withdrawal of Turkish troops from northern Persia to behind the pre-war frontier already has been ordered and will be carried out.
>
> *Eleventh.*—A part of Transcaucasia already has been ordered to be evacuated by Turkish troops. The remainder to be evacuated if required by the Allies, after they have studied the situation.
>
> *Twelfth.*—Wireless, telegraph and cable stations to be controlled by the Allies. Turkish Government messages to be excepted.
>
> *Thirteenth.*—Prohibition against destruction of any naval, military or commercial material.
>
> *Fourteenth.*—Facilities are to be given for the purchase of coal, oil fuel and naval material from Turkish sources, after the requirements of the country have been met. None of the above materials are to be exported.
>
> *Fifteenth.*—The surrender of all Turkish officers in Tripolitania and Cyrenaica

to the nearest Italian garrison. Turkey agrees to stop all supplies and communication with these officers if they do not obey the order to surrender.

Sixteenth.—The surrender of all garrisons in Hedjaz, Assir, Yemen, Syria and Mesopotamia to the nearest Allied commander, and withdrawal of Turkish troops from Cilicia, except those necessary to maintain order, as will be determined under Clause 6.

Seventeenth.—The use of ships and repair facilities at all Turkish ports and arsenals.

Eighteenth.—The surrender of all ports occupied in Tripolitania and Cyrenaica, including Misurata, to the nearest Allied garrison.

Nineteenth.—All Germans and Austrians, naval, military or civilian, to be evacuated within one month from Turkish dominions, and those in remote districts as soon after that time as may be possible.

Twentieth.—Compliance with such orders as may be conveyed for the disposal of equipment, arms and ammunition, including the transport of that portion of the Turkish Army which is demobilized under Clause 5.

Twenty-first.—An Allied representative to be attached to the Turkish Ministry of Supplies in order to safeguard Allied interests. This representative to be furnished with all aid necessary for this purpose.

Twenty-second.—Turkish prisoners are to be kept at the disposal of the Allied powers. The release of Turkish civilian prisoners and prisoners over military age is to be considered.

Twenty-third.—An obligation on the part of Turkey to cease all relations with the Central Powers.

Twenty-fourth.—In case of disorder in the six Armenian villayets the Allies reserve to themselves the right to occupy any part of them.

Twenty-fifth.—Hostilities between the Allies and Turkey shall cease from noon, local time, Thursday, the 31st of October, 1918.

On Nov. 8 it was reported that the British and French Governments had issued a joint declaration assuring the people between the Taurus region and the Persian Gulf assistance in securing full autonomy. The declaration promised encouragement and aid in the establishment of native governments in Syria and Mesopotamia and recognition as soon as the governments were effectively established.

Armistice with Austria-Hungary.—On Oct. 29 the commander of the Austro-Hungarian forces which were retreating before the Allied forces in Italy (see III, *The European War*) requested the Italian commander to grant an armistice on that front, and on the following day an Austrian deputation was permitted to cross the lines for a preliminary *pourparler.* The Italian commander submitted the proposal to Premier Orlando, then in Paris, and the terms upon which an armistice would be accepted were drawn up by the Interallied Conference at Versailles which were handed to the Austrian representatives on the Italian front on Nov. 1. The fast disintegrating monarchy promptly accepted the terms offered and at 3 o'clock on the afternoon of Nov. 4 the armistice, the terms of which were as follows, went into effect:

Military Clauses

One.—The immediate cessation of hostilities by land, sea and air.

Two.—Total demobilization of the Austro-Hungarian Army and immediate withdrawal of all Austro-Hungarian forces operating on the front from the North Sea to Switzerland. . . .

> [Restrictions upon size of organized military force, to be reduced to pre-war effectiveness, to be maintained within Austro-Hungarian territory, limited as in Clause 3.]

Half the divisional, corps and army artillery and equipment shall be collected at points to be indicated by the Allies and United States of America for delivery to them, beginning with all such material as exists in the territories to be evacuated by the Austro-Hungarian forces.

Three.—Evacuation of all territories invaded by Austro-Hungary since the beginning of war. Withdrawal within such periods as shall be determined by the commander-in-chief of the Allied forces on each front of the Austro-Hungarian armies behind a line fixed as follows: From Pic Umbrail to the north of the Stelvio it will follow the crest of the Rhetian Alps up to the sources of the Adige and the Eisach, passing thence by Mounts Reschen and Brenner and the Heights of Oetz and Zoaller. The line thence turns south, crossing Mount Toblach and meeting the present frontier Carnic Alps.

It follows this frontier up to Mount Tarvis and after Mount Tarvis the watershed of the Julian Alps by the Col of Predil, Mount Mangart, the Tricorno (Terglou) and the watershed of the Cols di Podberdo, Podlaniscam and Idria. From this point the line turns southeast toward the Schneeberg, excludes the whole basin of the Save and its tributaries. From Schneeberg it goes down toward the coast in such a way as to include Castua, Matuglia and Volosca in the evacuated territories.

It will also follow the administrative limits of the present province of Dalmatia, including to the north Liscaria and Trivania, and, to the south, territory limited by a line from . . . Cape

Planca to the summits of the watershed eastward, so as to include in the evacuated area all the valleys and watercourse flowing toward Sebenico, such as the Cicola, Kerka, Butisnica and their tributaries. It will also include all the islands in the north and west of Dalmatia from Premuda, Selve, Ulbo, Scherda, Maon, Pago and Puntadura in the north up to Meleda in the south, embracing Santandrea, Busi, Lisa, Lesina, Tercola, Curzola, Cazza and Lagosta, as well as the neighboring rocks and islets and passages, only excepting the islands of Great and Small Zirona, Bua, Solta and Brazza. All territory thus evacuated shall be occupied by the forces of the Allies and of the United States of America.

All military and railway equipment of all kinds, including coal belonging to or within those territories to be left *in situ* and surrendered to the Allies according to special orders given by the commander-in-chief of the forces of the associated powers on the different fronts. No new destruction, pillage or requisition to be done by enemy troops in the territories to be evacuated by them and occupied by the forces of the associated powers.

Four.—The Allies shall have the right of free movement over all road and rail and waterways in Austro-Hungarian territory and of the use of the necessary Austrian and Hungarian means of transportation. The armies of the associated powers shall occupy such strategic points in Austria-Hungary at times as they may deem necessary to enable them to conduct military operations or to maintain order.

They shall have the right of requisition on payment for the troops of the associated powers wherever they may be.

Five.—Complete evacuation of all German troops within 15 days, not only from the Italian and Balkan fronts, but from all Austro-Hungarian territory.

Internment of all German troops which have not left Austria-Hungary within the date.

Six.—The administration of the evacuated territories of Austria-Hungary will be intrusted to the local authorities under the control of the allied and associated armies of occupation.

Seven.—The immediate repatriation without reciprocity of all allied prisoners of war and interned subjects and of civil populations evacuated from their homes on conditions to be laid down by the commander-in-chief of the forces of the associated powers on the various fronts. Sick and wounded who cannot be removed from evacuated territory will be cared for by Austro-Hungarian personnel, who will be left on the spot with the medical material required.

NAVAL CONDITIONS

One.—Immediate cessation of all hostilities at sea and definite information to be given as to the location and movements of all Austro-Hungarian ships.

Notification to be made to neutrals that freedom of navigation in all territorial waters is given to the naval and mercantile marine of the allied and associated powers, all questions of neutrality being waived.

Two.—Surrender to Allies and the United States of 15 Austro-Hungarian submarines completed between the years 1910 and 1918 and of all German submarines which are in or may hereafter enter Austro-Hungarian territorial waters. All other Austro-Hungarian submarines to be paid off and completely disarmed and to remain under the supervision of the Allies and United States.

Three.—Surrender to Allies and United States with their complete armament and equipment of three battleships, three light cruisers, nine destroyers, 12 torpedo boats, one mine layer, six Danube monitors to be designated by the Allies and United States of America. All other surface warships, including river craft, are to be concentrated in Austro-Hungarian naval bases to be designated by the Allies and United States of America and are to be paid off and completely disarmed and placed under the supervision of Allies and United States of America.

Four.—Freedom of navigation to all warships and merchant ships of allied and associated powers to be given in the Adriatic and up the River Danube and its tributaries in the territorial waters and territory of Austria-Hungary.

The Allies and associated powers shall have the right to sweep up all mine fields and obstructions and the positions of these are to be indicated.

In order to insure the freedom of navigation on the Danube the Allies and the United States of America shall be empowered to occupy or to dismantle all fortifications or defense works.

Five.—The existing blockade conditions set up by the allied and associated powers are to remain unchanged and all Austro-Hungarian merchant ships found at sea are to remain liable to capture, save exceptions which may be made by a commission nominated by the Allies and the United States of America.

Six.—All naval aircraft are to be concentrated . . . in Austro-Hungarian bases to be designated by the Allies and United States of America.

Seven.—Evacuation of all the Italian coasts and of all ports occupied by Austria-Hungary outside their national territory and the abandonment of all floating craft, naval materials, equipment and materials for inland navigation of all kinds.

Eight.—Occupation by the Allies and the United States of America of the land and sea fortifications and the islands which form the defenses and of the dockyards and arsenal at Pola.

Nine.—All merchant vessels held by Austria-Hungary belonging to the Allies and associated powers to be returned.

Ten.—No destruction of ships or of materials to be permitted before evacuation, surrender or restoration.

Eleven.—All naval and mercantile marine prisoners of the allied and associated powers in Austro-Hungarian hands to be returned without reciprocity.

Armistice with Germany.—After the peace offer of Germany was forwarded by President Wilson to the Allies, the Interallied Council at Versailles met to draw up the terms of the armistice, which were agreed upon, according to the announcement of the Council, with entire unanimity. In addition to its military and naval representatives, the United States was represented by Col. E. M. House at these meetings of the Council. On Nov. 5 the President of the United States sent the following note to the German Government with reference to its previous correspondence looking to an armistice and peace:

> The President is now in receipt of a memorandum of observations by the Allied Governments on this correspondence which is as follows:
>
> "The Allied Governments have given careful consideration to the correspondence which has passed between the President of the United States and the German Government. Subject to the qualifications which follow they declare their willingness to make peace with the Government of Germany on the terms of peace laid down in the President's address to Congress of January, 1918, and the principles of settlement enunciated in his subsequent addresses. They must point out, however, that clause two, relating to what is usually described as the freedom of the seas, is open to various interpretations, some of which they could not accept. They must, therefore, reserve to themselves complete freedom on this subject when they enter the peace conference.
>
> "Further, in the conditions of peace laid down in his address to Congress of January 8, 1918, the President declared that invaded territories must be restored as well as evacuated and freed; the Allied Governments feel that no doubt ought to be allowed to exist as to what this provision implies. By it they understand that compensation will be made by Germany for all damage done to the civilian population of the Allies and their property by the aggression of Germany by land, by sea and from the air."
>
> I am instructed by the President to say that he is in agreement with the interpretation set forth in the last paragraph of the memorandum above quoted. I am further instructed by the President to request you to notify the German Government that Marshal Foch has been authorized by the government of the United States and the Allied Governments to receive properly accredited representatives of the German Government, and to communicate to them the terms of an armistice.

The armistice terms were delivered on Nov. 7 to the German delegates designated to receive them, a period of 72 hours being allowed the German Government to accept or reject the terms offered. The terms of the armistice as signed by the German delegates and Marshal Foch on Nov. 11 at 5 o'clock a. m. (French time) were as follows:

I. Military Clauses, Western Front

One.—Cessation of operations by land and in the air six hours after the signature of the armistice.

Two.—Immediate evacuation of invaded countries: Belgium, France, Alsace-Lorraine, Luxemburg, so ordered as to be completed within 14 days from the signature of the armistice. German troops which have not left the above mentioned territories within the period fixed will become prisoners of war. Occupations by the Allied and United States forces jointly will keep pace with evacuation in these areas. All occupation will be regulated in accordance with a note annexed to the stated terms.

Three. — Repatriation beginning at once, to be completed within 15 days, of all the inhabitants of the countries above enumerated (including hostages, persons under trial or convicted).

Four.—Surrender in good condition by the German armies of the following war material: Five thousand guns (2,500 heavy and 2,500 field), 25,000 machine guns, 3,000 minenwerfer, 1,700 aeroplanes (fighters, bombers, firstly all of the D sevens and all the night-bombing machines). The above to be delivered *in situ* to the Allied and United States troops in accordance with the detailed conditions laid down in the note (annexure No. 1) drawn up at the moment of the signing of the armistice.

Five.—Evacuation by the German armies of the countries on the left bank of the Rhine. The countries on the left bank of the Rhine shall be administered by the local troops of occupation. The occupation of these territories will be carried out by Allied and United States garrisons holding the principal crossings of the Rhine (Mayence, Coblenz, Cologne), together with the bridgeheads at these points of a 30-kilometre radius on the right bank, and by garrisons similarly holding the strategic points of the regions. A neutral zone shall be reserved on the right bank of the Rhine, between the stream and a line drawn parallel to the bridgeheads and the stream, and at a distance of 10 kilometres from the frontier of Holland up to the frontier of Switzerland. The evacuation by the enemy of the Rhinelands (left and right bank) shall be so ordered as to be completed within further period of 16 days, in all 31 days after the signing of the armistice. All the movements of evacuation or occupation are regulated by the note (annexure No. 1) drawn at the moment of the signing of the armistice.

Six.—In all territories evacuated by the enemy there shall be no evacuation of inhabitants; no damage or harm shall be done to the persons or property of the inhabitants. No persons shall be prosecuted for offenses of participation in war measures prior to the signing of the armistice. No destruction of any kind shall be committed. Military establishments of all kinds shall be delivered intact, as well as military stores of food, munitions and equipment, not removed during the period fixed for evacuation. Stores of food of all kinds for the civil population, cattle, etc., shall be left *in situ*. Industrial establishments shall not be impaired in any way, and their personnel shall not be removed.

Seven.—Roads and means of communication of every kind, railroads, waterways, main roads, bridges, telegraphs, telephones, shall be in no manner impaired. All civil and military personnel at present employed on them shall remain; 5,000 locomotives and 150,000 wagons in good working order with all necessary spare parts and fittings shall be delivered to the associated powers within the period fixed in annexure No. 2, and total of which shall not exceed 31 days. There shall likewise be delivered 5,000 motor lorries (camion automobiles) in good order within the period of 36 days. The railways of Alsace-Lorraine shall be handed over within the period of 31 days, together with the pre-war personnel and material. Further, the material necessary for the working of railways in the countries on the left bank of the Rhine shall be left *in situ*. All stores of coal and material for the upkeep of permanent way, signals and repair shops shall be left *in situ*. These stores shall be maintained by Germany in so far as concerns the working of the railroads in the countries on the left bank of the Rhine. All barges taken from the allies shall be restored to them. The note annexure No. 2 regulates the details of these measures.

Eight.—The German command shall be responsible for revealing within the period of 48 hours after signing of the armistice all mines or delayed action fuses on territory evacuated by the German troops and shall assist in their discovery and destruction. It shall also reveal all destructive measures that may have been taken (such as poisoning or polluting of springs and wells, etc.). All under penalty of reprisals.

Nine.—The right of requisition shall be exercised by the Allied and United States armies in all occupied territories, subject to regulation of accounts with those whom it may concern. The upkeep of the troops of occupation in the Rhineland (excluding Alsace-Lorraine) shall be charged to the German Government.

Ten.—The immediate repatriation without reciprocity, according to detailed conditions which shall be fixed, of all Allied and United States prisoners of war, including persons under trial or convicted. The Allied powers and the United States shall be able to dispose of them as they wish. This condition annuls the previous conventions on the subject of the exchange of prisoners of war, including the one of July, 1918, in course of ratification. However, the repatriation of German prisoners of war interned in Holland and Switzerland shall continue as before. The repatriation of German prisoners of war shall be regulated at the conclusion of the preliminaries of peace.

Eleven.—Sick and wounded who cannot be removed from evacuated territory will be cared for by German personnel who will be left on the spot with the medical material required.

II. Eastern Frontiers

Twelve.—All German troops at present in the territories which before belonged to Austria-Hungary, Rumania, Turkey, shall withdraw immediately within the frontiers of Germany as they existed on August 16, 1914. All German troops at present in territories which before the war belonged to Russia shall likewise withdraw within the frontiers of Germany, defined as above, as soon as the allies, taking into account the internal situation of these territories, shall decide that the time for this has come.

Thirteen.—All German instructors, prisoners and civilian, as well as military agents, now on the territory of Russia (as defined before 1914), to be recalled.

Fourteen.—German troops to cease at once all requisitions and seizures and any other undertaking with a view to obtaining supplies intended for Germany in Rumania and Russia (as defined on August 1, 1914).

Fifteen.—Renunciation of the treaties of Bucharest and Brest-Litovsk and of the supplementary treaties.

Sixteen.—The Allies shall have free access to the territories evacuated by the Germans on their eastern frontier, either through Dantzig or by the Vistula, in order to convey supplies to the populations of those territories and for the purpose of maintaining order.

III. East Africa

Seventeen.—Evacuation by all German forces in East Africa within a period to be fixed by the Allies.

IV. Repatriation and Reparation

Eighteen.—Repatriation, without reciprocity, within a maximum period of one month in accordance with detailed conditions hereafter to be fixed of all interned civilians, including persons under trial or convicted, belonging to the Allied or associated powers other than those enumerated in article three.

Nineteen.—The following financial conditions are required: Reparation for damage done. While such armistice lasts no public securities shall be removed by the enemy which can serve as a pledge to the Allies for the recovery or reparation for war losses. Immediate restitution of the cash deposit in the National Bank of Belgium, and in general immediate return of all documents, specie, stocks, shares, paper money, together with plant for the issue thereof, touching public or private interests in the invaded countries. Restitution of the Russian and Rumanian gold yielded to Germany or taken by that power. This gold to be delivered in trust to the Allies, until the signature of peace.

V. CONDITIONS FOR NAVY

Twenty.—Immediate cessation of hostilities at sea and definite information to be given as to the location and movements of all German ships. Notification to be given to neutrals that freedom of navigation in territorial waters is given to the naval and mercantile marines of the allied and associated powers, all questions of neutrality being waived.

Twenty-one.—All naval and mercantile marine prisoners of war of the allied and associated powers in German hands to be returned without reciprocity.

Twenty-two.—Surrender to the Allies and United States of all submarines (including submarine cruisers and all minelaying submarines) now existing with their complete armament and equipment, in ports which shall be specified by the Allies and United States. Those which cannot take these shall be disarmed of the personnel and material and shall remain under the supervision of the Allies and the United States. The submarines which are ready for the sea shall be prepared to leave the German ports as soon as orders shall be received by wireless for their voyage to the port designed for their delivery, and the remainder at the earliest possible moment. The conditions of this article shall be carried into effect within the period of 14 days after the signing of the armistice.

Twenty-three.—German surface warships which shall be designated by the Allies and the United States shall be immediately disarmed and thereafter interned in neutral ports, or, in default of them, in Allied ports to be designated by the Allies and the United States. They will there remain under the supervision of the Allies and of the United States, only caretakers being left on board. The following warships are designated by the Allies: Six battle cruisers, 10 battleships, five light cruisers (including two mine layers), 50 destroyers of the most modern types. All other craft are to be concentrated in German naval bases to be designated by the Allies and the United States and are to be completely disarmed and classed under the supervision of the Allies and the United States. The military armament of all ships of the auxiliary fleet shall be put on shore. All vessels designated to be interned shall be ready to leave the German ports seven days after the signing of the armistice. Directions for the voyage will be given by wireless.

Twenty-four.—The Allies and the United States of America shall have the right to sweep all mine fields and obstructions laid by Germany outside German territorial waters, and the positions of these are to be indicated.

Twenty-five.—Freedom of access to and from the Baltic to be given to mercantile marines of the allied and associated powers. To secure this the Allies and the United States of America shall be empowered to occupy all German forts, fortifications, batteries and defense works of all kinds in all the entrances from the Cattegat into the Baltic and to sweep up all mines and obstructions within and without German territorial waters without any question of neutrality being raised, and the positions of all such mines and obstructions are to be indicated.

Twenty-six.—The existing blockade conditions set up by the allied and associated powers are to remain unchanged, and all German merchant ships found at sea are to remain liable to capture. The Allies and the United States should give consideration to the provisioning of Germany during the armistice to the extent recognized as necessary.

Twenty-seven.—All naval aircraft are to be concentrated and immobilized in German bases to be specified by the Allies and the United States of America.

Twenty-eight.—In evacuating the Belgian coast and ports Germany shall abandon *in situ* and in fact all port and river navigation material, all merchant ships, tugs, lighters, all naval aeronautic apparatus, material and supplies, and all arms, apparatus and supplies of every kind.

Twenty-nine.—All Black Sea ports are to be evacuated by Germany; all Russian war vessels of all descriptions seized by Germany in the Black Sea are to be handed over to the Allies and the United States of America; all neutral merchant vessels seized are to be released; all warlike and other materials of all kinds seized in those ports are to be returned and German materials as specified in clause twenty-eight are to be abandoned.

Thirty.—All merchant vessels in German hands belonging to the allied and associated powers are to be restored in ports to be specified by the Allies and the United States of America without reciprocity.

Thirty-one.—No destruction of ships or of materials to be permitted before evacuation, surrender or restoration.

Thirty-two.—The German Government shall formally notify the neutral Governments of Norway, Sweden, Denmark and Holland, that all restrictions placed on the trading of their vessels with the allied and associated countries, whether by the German Government or by private German interests, and whether in return for specific concessions such as the export of shipbuilding materials or not, are immediately cancelled.

Thirty-three.—No transfers of German merchant shipping of any description to any neutral flag are to take place after signature of the armistice.

Thirty-four.—The duration of the armistice is to be 30 days,[1] with option to extend. During this period if its clauses are not carried into execution the armistice may be denounced by one of the contracting parties, which must give warning 48 hours in advance. It is understood that the execution of articles three and eighteen shall not warrant the denunciation of the armistice on the ground of insufficient execution within a period fixed, except in the case of bad faith in carrying them into execution. In order to assure the execution of this convention under the best conditions the principle of a permanent international armistice commission is admitted. This commission will act under the authority of the Allied military and naval commanders-in-chief.

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[1] The duration of the armistice was subsequently extended for a further period of 30 days.

The Versailles Interallied Conference, which drew up the armistice terms, pronounced in favor of provisioning the Central Powers during the period between the signing of the armistice and the treaty of peace, indicating that the German merchant marines in the hands of the associated governments might be used for this purpose. President Wilson in notifying Congress of the armistice terms also emphasized the need of this, and plans were immediately put under way for sending over the necessary quantities of foodstuffs. Appeals were sent to the United States by the German Minister of Foreign Affairs for foodstuffs and for a convocation of the peace conference at the earliest possible date. The American Government requested the German Government to address appeals of this character in future to each of the associated Governments instead of merely to the United States, and this was done in the case of the request for a modification of the armistice conditions with reference to the left bank of the Rhine.

In an address to his supporters in the Liberal Party in anticipation of the forthcoming general elections in Great Britain, Premier Lloyd George on Nov. 11 earnestly urged support of a just peace—not a peace of vengeance or avarice—and the establishment of a league of nations to enforce peace.

Following the conclusion of the armistice, preparations were made for the Conference of the Associated Governments, to be held at Paris, to agree upon the terms of peace to be offered to Germany. The American delegation to the Peace Conference was headed by President Wilson, himself, who indicated in an address to Congress his belief that the importance of the issues involved, including that of the league of nations, rendered it highly important that he personally participate. The other members of the delegation appointed by the President were Secretary of State Lansing, Henry White, formerly American Ambassador to France, Col. E. M. House, and Gen. Tasker H. Bliss, American military representative on the Interallied Council at Versailles. The legal and other questions raised by the absence of the President abroad and by the proposed league of nations caused considerable discussion in the Senate and through the country. The President and the other delegates left early in December for Europe and the time which elapsed before the assembling of the Conference at Paris was spent by the President in visits to England and Italy and in conferences with British, French and Italian leaders for the purpose of arriving at a uniformity of views on the subject of the league of nations, territorial adjustments, and other important questions to be passed upon by the Peace Conference, which was not to begin formal sessions until January.

III. FOREIGN AFFAIRS

LATIN AMERICA

Roscoe R. Hill

General Survey.—The year 1918 was one of notable progress in every line in Latin America. The Latin American countries continued to feel the effects of the Great War. It should be noted, however, that numerous beneficial results have accrued to these nations from the conflict. To meet the necessities which have arisen because of the war, they have been compelled to give increased attention to industrial activity, to the development of new lines of trade, to the study of natural resources, and to the production of new crops. In general, the financial situation has tended to improve, although some countries still experience difficulties with their budgets. A few of the countries have become creditor nations. On the other hand, all the republics have been hampered by the lack of transportation facilities and have had to take steps to control the food situation. Since the outbreak of the war, Latin America has looked almost entirely to the United States for her imports. The trade regulations made by the United States after her entry into the war worked decided hardship on Latin America, and being little understood, were severely criticized in many parts.

The internal political conditions were more peaceful than they have ever been. Sporadic revolutionary activity in Mexico and a slight disturbance in Costa Rica were the only events to mar the almost perfect internal peace. Presidential elections were held in Brazil, Colombia and Uruguay in a most orderly fashion.

The international relations of the Latin American countries were most friendly, with the exception that most of them were either at war with the Central Powers or had severed diplomatic relations. Three new countries, Costa Rica, Guatemala and Nicaragua, entered the list of belligerents during 1918 (see also II, *International Relations*). Thus it became more and more evident that the extensive pro-German propaganda in Latin America had failed and that with minor exceptions the Governments and the people of these nations were on the side of the Allied powers. Treaties of arbitration and commerce and other agreements were the manifestations of the friendly feelings of Latin America with the world. There was a continued development of Pan-American solidarity, which was evidenced especially in the approval given to the utterances of President Wilson along this line (see II, *International Relations*). The formation of the Pan-American Federation of Labor at Laredo, Tex., in November, with headquarters at Washington, was another evidence of the continued growth of Pan-Americanism (see also XV, *Labor*).

The inter-Latin American relations were maintained on the same friendly basis of the preceding year. Adjustment of several long-standing boundary disputes was made. Many beneficial treaties relating to arbitration, commerce and other matters were concluded. The Central American Court of Justice closed its labors on March 12 as the ten-year term of the original agreement was not extended by the participants (see also II, *International Relations*). Nevertheless, the agitation for a closer political union of the Central American republics has continued. A meeting to consider this important subject was held in Guatamala City in February. The threatened breaking of relations between Chile and Peru (see II, *International Relations*) and between Honduras and Nicaragua were the only exceptions to these friendly inter-Latin American relations.

Internal improvements continued to receive much attention, especially in the form of road building and railway extension. Advancement was noted in all countries in education and in physical and social welfare. Economic and industrial development showed marked progress. Appropriate legislation was enacted and suitable executive decrees were issued to effect progress in these various lines. Many congresses and conferences were held to discuss measures for the advancement and development of the several nations. Numerous national and regional agricultural and industrial expositions were held, which emphasized the important steps taken along these lines.

Argentina. — Hipólito Irogoyen, whose four-year term expires in 1920, occupied the presidency in 1918. His annual message to Congress (the first radical Congress of Argentina) stated that the total debt at the beginning of the year amounted to 1,353,815,302 pesos currency, of which 587,799,713 pesos was not consolidated. He added that the budget was inadequate and that the Government was unable to meet its obligations. The message also discussed the Army and Navy, shipping and maritime freight rates, the exploitation of railways, and the work of the Department of Agriculture. Congress was asked to approve legislation providing for the reformation of the penal code, control of bankruptcy, regulation of matters of justice, and reorganization of the schools and methods of education.

Foreign relations were greatly effected by the Great War. The President was insistent on maintaining neutrality, although Germany persisted in disregarding Argentinian rights. The sinking of the steamer *Ministro Irrendo* in January threatened a break. There was much criticism of the President's attitude by the public and the newspapers. Romulo S. Naon, Ambassador to the United States, who was actively pro-Ally, resigned his post in protest against the attitude of the Administration. A Mexican mission headed by General Cabrera which visited Argentina was accorded a cool reception on account of its pro-German proclivities. A boundary treaty was concluded with Uruguay (*q.v.*). The joint celebration of the centennial of the battle of Maipu by Argentina and Chile served to aid the establishment of important commercial and intellectual relations.

Early in the year there was a railway strike which created serious difficulties. It was said that this situation was brought about largely by pro-German agitation, with the object of preventing the movement of the grain crop, large amounts of which were expected to go to the Allies. The trade with the United States, which during the war has assumed great importance, was greatly hampered by the lack of shipping and by the war-trade regulations of the United States. These regulations were little understood in Argentina and caused much adverse criticism there. Methods for the arbitration of commercial disputes were put into force by the chambers of commerce of Argentina and the United States and proved expeditious and inexpensive. With a view to added commercial development, there was much discussion of the establishment of free trade among the South American countries. Argentina, like all other countries, had to face the food problem. New export duties were laid to prevent the too great outflow of foodstuffs. By law the control of the export of articles of prime necessity was placed in the hands of the president, who in August prohibited the export of a number of articles.

President Irogoyen visited Patagonia and this occasioned a lively discussion of the problems of that region. It was urged that the large foreign population there should be nationalized. The first National University Congress was held at Cordova in July, and the Congress of the Catholic Press at Buenos Aires in April. The budget provided for expenditures amounting to 390,826,634 pesos paper (peso paper = $0.47 U. S.).

Bolivia.—José Nestor Gutiérrez, who assumed the executive chair in 1917, continued his administration through the year. During the past few years Bolivia has devoted much energy to the extension of highways and railroads. The financing of these projects continued to be one of the chief concerns of the Government. Figures were published showing the excessive amount of drunkenness in La Paz, and this led to a strong agitation against alcoholism, in which Sunday closing was especially urged. A law was passed prohibiting the importation of alcoholic liquors and regulating the taxes on those manufactured at home. The military-service law and the printing law of 1900 were amended. With a view to the development of the agricultural resources of the country a mission was sent to Japan to arrange for the immigration of 10,000 Japanese farmers. The difficulties of Chile and Peru over the Tacna-Arica question (see II, *International Relations*) brought out the suggestion that in the settlement of the dispute a port should be granted to Bolivia. The budget estimated the receipts at 32,586,886 bolivianos and the expenditures at 36,144,915 bolivianos.

Brazil.—Wenceslao Braz occupied the Presidency for the major portion of 1918. In the national election in March Rodríguez Alves, who was President from 1902-6, was chosen chief magistrate, and Delfim Moreira, Vice-President. These candidates were elected on a war platform and the newly-elected President stated that Brazil would stay in the war as long as the United States and that she would practice Pan-Americanism to the fullest extent. The inauguration took place on Nov. 15. Brazil has secured numerous beneficial results from the war. New industries have been developed which are actively producing for foreign markets. The country now enjoys a better morale and the people in general show a larger interest in national affairs. A more genuine Pan-Americanism has developed and the relations with her neighbors have improved.

Brazil maintained friendly relations with all the powers, excepting those belonging to the Teutonic Alliance. This friendliness was manifested in numerous treaties. Among these were a treaty of arbitration with Peru, a treaty with Uruguay providing for the liquidation of the outstanding debt of Uruguay to Brazil, a treaty for extradition of criminals with Uruguay, a postal-package convention with Chile, and an extradition treaty with Bolivia. Brazil also ratified the resolutions of the Fourth Conference of American States regarding the Pan-American Railway and the taking of census.

A decree of Dec. 27, 1917, authorized the President to revise the military-service law. This revision had for its objects the establishment of a non-professional national army, the provision of an army of the first and second line, the fixing of the age limits for these armies, and the modification and simplification of the system of enlisting and drafting men into the army. A decree of May 30 provided for the incorporation of the National Guard into the Regular Army. Much attention was given to fostering the development of agriculture and industries. Subsidies and bounties were offered for wheat culture, reforestation, ship building, cotton, iron and steel manufacture, coal mining, and the manufacture of caustic soda. Investigations were carried on respecting jute production and tobacco and fruit culture. Much money was spent in road building.

Brazil suffered like other countries from lack of transportation facilities which seriously affected the food supply of the nation. To meet the food problems, a food administration was established to control and ameliorate the situation. By a decree of July 19, international exchange was placed under Government control. At the beginning of the year, the foreign debt amounted to $561,078,142. Brazil's credit is excellent at present, much improvement having taken place in this respect in the past few years. Further to better the financial situation, the Government is building up the gold reserve by the purchase of the gold mined in the country.

Chile. — President Luis Sanfuentes, whose term expires in 1919, occupied the executive during the year. His message to Congress in June affirmed the policy of neutrality in the world conflict and discussed the financial situation of the country. A new Cabinet was formed in March with

Domingo Amunátegui at its head. It resigned the next month and a coalition Cabinet (liberals and radicals) was formed under the leadership of Arturo Alessandri. This Cabinet resigned in July but stayed in power until November, when the third Cabinet for the year was formed with the following personnel: Minister of Interior, Armando Quezada; Foreign Relations, Luis Barros Borgono; Finance, Luis Claro Solar; Industries, Vicente Adrian; Justice, Luis Orego Luco; and War, Enrique Bermúdez. The neutrality maintained in 1918 was quite friendly to the Allies. There was, however, much pro-German propaganda, especially by the German-Chilean League. During the summer, there were signs of friction with Germany, while in September the machinery of several interned German ships was destroyed by the crews. The relations of Peru and Chile were strained late in the year over the old Tacna-Arica question (see II, *International Relations*).

The new monetary law empowers the mint commission to issue bills upon the deposit of 18 cents gold per dollar. A sanitation code was promulgated which created a department of health and a superior council of hygiene and set forth rules and regulations for sanitation and the conservation of health. A bill was introduced in Congress providing for the establishment of a national merchant marine. The Chilean League of Social Hygiene carried on an active propaganda against alcoholism and recommended heavy taxes on all alcoholic liquors. The budget for 1918 was fixed at 206,994,238 pesos paper (paper peso = $0.33 U. S.) and 64,889,666 pesos gold (gold peso = $0.365).

Colombia.—José Vicente Concha occupied the Presidency during the first seven months of the year and brought to a close an administration which did much for the country. At the Presidential election held in February, Marco Fidel Suárez, the conservative candidate, was elected. He was inaugurated on Aug. 7. President Suárez, who was Minister of Foreign Affairs under his predecessor, brought a long and varied political experience to the Presidency and his four-year term promises great progress for Colombia. The new President organized his Cabinet with Pedro Antonio Molina as Secretary of the Interior, Jorge Holquín, Foreign Relations; Marcelino Arango, Finance; Jorge Roa, War; Emilio Ferrero, Public Instruction; Simón Araújo, Agriculture and Commerce; Rafael del Corral, Public Works; and Pedro A. López, Treasury.

Early in the year there were some railway strikes, accompanied by quite serious disturbances, but they were adjusted without great difficulty. A loan of $3,000,000 gold at 10 per cent. was floated in May. Decrees were issued providing for the taking of a census. An important law was promulgated regulating the exploitation of the national maritime salt deposits and fixing the price of salt. The third Medical Congress met in Cartegena on Jan. 15. The budget for the fiscal year (ending Feb. 28, 1919) estimated the receipts at 17,650,000 pesos gold (gold peso = $0.9733 U. S.) and the expenditures at 17,106,061 pesos gold.

Costa Rica.—President Federico Tinoco, who came into power through the revolution of February, 1917 (*A. Y. B.*, 1917, p. 79), controlled the executive during 1918. His *régime* was not recognized by the United States and in November a demonstration before the United States Legation was broken up by the authorities because of their dislike of non-recognition. A slight revolt which was instigated by German influences occurred in February but was quickly suppressed. Those implicated were granted an amnesty by executive decree. An extra session of Congress in March considered the payment of wharfage services, the restriction of free imports, the removal of the duty on imports of cattle, and the imposing of a tax on cattle slaughtered for food. The regular session of Congress assembled on May 1. The President's message discussed educational progress and the efforts of the administration to promote order and peace, to maintain the credit of the nation, and to encourage the development of agriculture, manufactures and arts. Congress gave a vote of confidence to the Tinoco Government and passed a resolution expressing regret at the attitude of the United States to the republic. A declaration of war against the Central Powers was issued on May 25.

Laws were passed providing for the fixing of a maximum price on articles of prime necessity and for the free importation of cattle. A war tax was put in force which levied 10 per cent. on banks, loan agents and pawn brokers and two per cent. on the sales of mercantile and industrial establishments. Important executive decrees were issued regulating the export of sugar, coastwise service, and the granting of passports. A superintendence of insurance was created and the registration of all insurance policies was made obligatory. A Supreme Court decision held that all contracts in colones would be considered gold colones (gold colon = $0.4653 U. S.). In order better to prepare the members of the legal profession and somewhat limit the number, the course in the School of Law of Costa Rica was increased from six to seven years. The budget for the fiscal year estimated the receipts at $2,038,448 U. S. and the expenditures at $2,031,206.

Cuba.—President Mario Menocal, whose second term expires in 1921, occupied the executive chair in 1918. In two messages to Congress (January and May) he discussed the situations growing out of the war and commerce and finance. It was pointed out that the revolutionary debt was practically all paid and that all interest payments were regularly met. A loan of $15,000,000 was secured from the United States Government to meet the expenses of the Government. Outside the participation in the war, foreign relations presented no problems except in the case of Mexico. This latter country withdrew its *chargé d'affaires* from Havana, giving no very satisfactory explanation of the act. It was generally believed that the step was due to German influences.

An obligatory military service law was put in force in August. It provided for a draft of male citizens from 21 to 28 years, and for obligatory military training of male citizens from 19 to 25 years. The registration under the draft took place in October. To meet the food situation a law was passed establishing a food administration with extensive powers. The Government was empowered to purchase foodstuffs and to seize means of transportation if necessary. Prices of necessities were fixed and penalties for violation were imposed by executive decree. An espionage law was enacted in August which provided that treatment accorded to enemies should be given to neutrals who in time of war favored an enemy country. An amnesty was granted in March to those implicated in the revolution of 1917. A divorce law and one increasing the salaries of public employees were placed in the statutes.

The electoral law of Cuba is notably defective as the officials have no power to prevent fraud. The present administration is pledged to reform and steps in this direction were taken by the introduction in congress of the Maza y Artola bill. This provides for an obligatory vote, the use of finger prints and photographs to identify the elector and prevent the stuffing of the ballot box, and the public counting of the ballots. Numerous restrictions were placed on enemy aliens and a custodian of alien property was appointed in September. Pro-Germanism was active and to stamp it out a committee of public safety was created in April. Measures were taken to settle the famous Cuban Ports case by granting to bondholders of this company Government bonds of equal value. Much attention was given to road building and the construction of school houses. The budget calculated the receipts at $64,460,000 and the expenditures at $54,394,865.

Dominican Republic.—The administration of the Dominican Republic during the year remained in the hands of the American military government. The important legislation included a new license law, a law regulating concessions which prohibited their sale or transfer and provided for cancellation in case of non-development, and a law governing the use of public highways which provided for their protection and established regulations and taxes for vehicles. An office of food control and a bureau of employment were established to meet existing emergencies. To facilitate the adjustment of the affairs of the Dominican Republic, an executive order of June 13 empowered the committees of the Dominican Claims Commission of 1917 to subpoena and compel the attendance of witnesses and to require the presentation of documentary evidence either public or private. The sale of narcotic drugs was placed under license by executive decree. The budget for 1918 estimated the receipts at $6,210,000 U. S.

Ecuador.—President Alfredo Baquerizo Moreno continued his successful administration during 1918. The chief problem of the year was the high cost of living. Many steps were taken to ameliorate the situation, including especially regulations providing for the sale of articles of prime necessity at moderate prices. Important changes were made in the tariff law. Various measures were taken to foster the development of the natural resources of the country, among them being a law encouraging tobacco culture and exempting the manufactured product from export taxes. National agricultural expositions were held in Quito in August, and Guayaquil in October. The budget of 1917 was continued in force for 1918.

Guatemala. — The administration was in control of President Estrada Cabrera, who is serving his sixth term. The Presidential message in March gave an account of the series of earthquakes suffered by the country, the measures taken by the Government in the emergency, and the steps taken in rebuilding the capital. It also dealt with the elections, the administration of justice, the work of the hospitals, and public works. The statement regarding public instruction showed that in 1917 there were 1,942 primary schools with 54,479 pupils, 20 training schools for boys and six for girls. The legislative assembly issued a decree (April 23) stating that Guatemala took the same position as belligerent as the United States. This decree was considered a declaration of war against Germany. An agreement was reached with Honduras by which the boundary dispute of the two countries was to be arbitrated by the United States.

The series of earthquakes which began in November, 1917, culminated on Jan. 6 with the complete destruction of the capital, Guatemala City (see also XXII, *Earthquakes and Volcanoes*). Recovery from the effects of this devastation occupied the country throughout the year. There was much important legislation. A law of April 11 established a national bank, the majority of the stock to be held by the Government. Another placed a tax on spirits, the proceeds to be devoted to the reconstruction of the capital (April 28). A third law conferred the usual extraordinary powers upon the President to be used during the legislative recess (April 28; see *A. Y. B.*, 1917, p. 81). Executive decrees were issued providing for exemption from military service upon the payment of a fixed sum of money (March 1); for the continuance of martial law and the suspension of the individual guarantees of the constitution (May 4); granting an amnesty for all political crimes committed prior to Dec. 25, 1917, and materially reducing the sentences of all convicts (July 3); and admitting free of duty building materials to be used in reconstruction work (Jan. 4). The budget for 1918-19 called for 66,497,358 pesos (38 pesos = $1 U. S.).

Haiti.—President Sudre Dartiguenave, whose term expires in 1919, occupied the executive chair during the year. A new constitution was submitted to the people (June 19) and approved by a vote of 85,775 for to 850 against. The most important change introduced related to the right granted to foreigners and foreign companies to acquire and own real estate. The food situation presented many problems to the Administration. A decree was issued fixing the price of bread, meat and sugar. It was also provided that no imported articles of prime necessity should be passed through the custom houses of the republic until the owners pledged themselves not to sell for a profit of more than 10 per cent. The regular municipal elections were held on Jan. 15. A number of concessions which had been granted by the Government were revoked on account of the failure of the holders to comply with the provisions of the grant.

Honduras.—The administration of President Francisco Betrand, whose term expires in 1919, continued during 1918. A treaty of free commerce was entered into with Salvador providing for the free passage of all articles, except Government monopolies, across the frontiers and through the ports of the Gulf of Fonseca. The treaty was not to be considered a precedent for the most-favored-nation clause of other treaties. Another treaty with the same country related to the boundary question and arranged for a mixed commission and the arbitration of the disputed points. A treaty of limits was negotiated with Guatemala (*q. v.*) and the boundary dispute with Nicaragua (*q. v.*) was referred to the United States for adjustment. The President was authorized to establish the "Bank of the Republic of Honduras" with a capital of 1,000,000 pesos silver (silver peso = $0.6918 U. S.), one-half subscribed by the Government and one-half by capitalists. This institution is a bank of issue (the only one in the republic), deposit and discount. Steps were taken to secure the establishment of a gold standard of coinage. Educational statistics published in January showed great progress along this line. According to these figures, during the last school year there were 925 schools, of which 533 were urban and 392 rural. There were 88,158 children of school age in the republic, 565 normal students, 200 college, 24 law, and 30 medical students. The sum of 963,950 pesos was set aside for educational expenses during the year. The new legislation included a municipal treasury law, a pharmacy law, and a law establishing bounties for the cultivation of fibrous plants. By decree coffee was exempted from export taxes for a period of five years. The monopoly of the lighterage system of the ports held by Germans was ended by an embargo on the lighters and the internment of the owners. Extensive work on the public highways was carried out. The budget for the fiscal year 1918-19 was estimated to balance at 6,471,661 pesos.

Mexico.—The position of President Venustiano Carranza was much more secure than in the preceding year and showed signs of increasing strength. With respect to the Great War, an attitude of official neutrality was maintained although it was very apparent that the Carranza *régime* was very friendly to Germany. This attitude greatly affected the measures taken in internal administration as well as the foreign affairs. Pro-German activity was continued and found here a warmer welcome than elsewhere in Latin America. The United States found difficulty in carrying on relations because of this attitude and other countries of the Allies found it necessary to protest against acts of the Government evidently designed to hamper their cause. The other Latin American countries were suspicious of the motives of Mexico. The Mexican delegation to the Latin-American Peace Conference, which was to meet in Buenos Aires, was arrested in Brazil on the charge of being a group of German sympathizers. Cabrera and his associates found little welcome in Argentina on account of their pro-German views. The recall of the *chargé d'affaires* at Havana, which threatened a break with Cuba, was quite manifestly instigated by pro-German interests. The rumors of the cession of a naval base on the west coast to Japan were revived but were emphatically denied by Carranza. The treatment accorded the petroleum industry brought Mexico into difficulties with Great Britain and the United States (see II, *International Relations*) because this industry is largely controlled by capital from these countries. Decrees of Feb. 27 and July 31 of a highly confiscatory character, apparently issued for the purpose of aiding Germany by cutting off oil supplies from England, were modified by a decree of Aug. 12, but this was not satisfactory to foreign owners and leaseholders, and at the close of the year the matter was still unsettled. Some of the oil fields remained in the hands of bandits and those exploiting them were compelled to subsidize their leaders.

The special session of Congress in April considered a national election law. With a view to fostering agriculture, a law was passed providing for the entry free of duty of agricultural machinery (August). A plan for differential tariffs which should foster trade with countries not placing restrictions on trade with Mexico was proposed. Much of the governmental activity usually carried out by legislation was effected by executive decree. Important decrees were issued forbidding the export of textile plants and seeds, fixing stamp taxes on gold, silver and industrial metals, establishing property taxes on mining claims, and prohibiting the export of cotton. The Subsistence Commission worked to relieve the food shortage. In order to curtail the production of alcoholic liquors it was proposed to make sugar from the maguey instead of pulque. The state of Yucatan passed a law calling on the national Congress to pass a modified prohibitory law. A number of congresses were held which discussed appropriate subjects relating to the progress and improvement of the nation. These included the fifth annual Medical Congress (January), a Congress of Workingmen at Saltillo (May), the first Municipal Congress at Mexico City (September), the second National Congress of Merchants at Mexico City (September), and an Indo-Hispanic Congress at Saltillo (December).

There was sporadic revolutionary activity, especially in the north, headed by Villa, but in no case did it reach serious proportions. Villa and the other opposition leaders seemed to content themselves with an occasional raid on some town to replenish their stock of supplies and money. The efforts of the loyal commanders, however, were not sufficient to completely stamp out the opposition to the Administration. There were a few minor border raids which tended toward difficulties with the United States.

Nicaragua.—Emilio Chamorro, who assumed the Presidency in 1917, administered the affairs of the republic during 1918. In his first annual message to Congress (met Dec. 15, 1917) he reviewed the progress of his first year's Administration. He pointed out the complete liberty enjoyed by the press, the admirable work of the department of justice, and the faith of the people in the promises of the Government as shown by the elections. He commented on the friendly foreign relations, detailed the encouragement given to public instruction and discussed agriculture and finance. His message to the special session of Congress (May) dealt with the dredging of the San Juan River and a concession for this purpose. In May war was declared upon Germany. A new tariff law, well classified and up-to-date, which superseded the old system of one tariff for the Atlantic ports and another for the Pacific, was put into force on March 1. Legislation was enacted to effect the consolidation and payment of the public debt. A difficulty over the boundary with Honduras (*q. v.*) occurred because of the unsatisfactory decision of the King of Spain. Troops were despatched to the border but upon the suggestion of the United States the troops were withdrawn and the controversy was submitted to the United States for adjustment. A new political party, under the name of Independent-Republican, was formed of elements of all the existing parties. Its candidate for the Presidency in the election of 1920 is Adolfo Vivas. The budget for 1918 called for 1,140,000 cordobas (cordoba = $1 U. S.).

Panama.—President Ramon M. Valdez, who was elected in 1916, died on June 3 and was succeeded by Ciro L. Urriola. The new President formed his Cabinet with Juan B. Sosa as Secretary of Interior and Justice; Guillermo Andrede, Public Instruction; Ernesto Lefevre, Foreign Relations; Aurelio Guardia, Finance and Treasury; and José Agustin Arango, Fomento and Public Works. Chaotic political conditions ensued at the opening of the new Administration over the question of the elections to be held in July. The United States assumed police control in the republic. To this act President Urriola entered a vigorous protest and sought to have the elections postponed and conducted under a partial supervision of the United States. The elections for members of the National Assembly were finally held on July 7 with no serious difficulties. A law was promulgated regarding the nationalization of vessels. A project was worked out providing for the expenditure of $2,000,000 on road building between Panama and Colon. The proposed highways are to be constructed with a view to serving military purposes. Numerous important subjects were considered by the National Assembly which met on Sept. 1. These included the Chiriqui railway, the extension of highways, the development of the educational facilities, internal revenues, vice and liquor problems, and the relations with Latin America.

Paraguay.—President Manuel Franco, whose term expires in 1920, occupied the executive seat in 1918. His message to Congress (April 1) reviewed the progress of the preceding year, which was declared to be one of peace and prosperity. The message contained an account of the development of the city of Asunçion, a statement of the work of the Government in hygiene and public health, a *résumé* of the boundary negotiations with Bolivia, and a list of conventions and treaties concluded. Finances and the public debt were discussed. The President stated that Paraguay accepted the principles of American solidarity as laid down by President Wilson in his address to the Mexican newspaper men. Interesting educational statistics were also presented. During the last school year there were 1,512 teachers in the public and private elementary schools, 3,039 students in the normal schools, 795 students in the grammar schools, and 234 students in the various schools of the university. The sum of 200,000 pesos was set aside for the construction of school buildings. The food situation gave the Government much concern, and to relieve it the exportation of wheat was forbidden by decree up to May 12. The budget for the fiscal year ending June 30 estimated the income at 911,112 pesos gold and 59,690,700 pesos paper and the expenditures at 1,016,835 pesos gold and 65,486,657 pesos paper.

Peru.—President José Pardo, whose term expires in 1919, continued his administration through the year. Several changes took place in the Cabinet early in the year and in June it was completely reorganized with Francisco Tudela as Secretary of Foreign Affairs; Samuel Sayan y Palacios, Interior and Police; Victor M. Maurtua, Treasury; Ricardo Flórez, Justice and Instruction; Cesar A. de la Fuente, War and Marine; and Clemente J. Revilla, Fomento. Congress met in two extra sessions in January and February, and in the regular session in July. The first extra session considered the general budget and departmental bill, export duties, gold certificates, the normalization of foreign exchange, revenue stamps, taxes and charges for licenses, railways, and the Peruvian Steamship Co. The Presidential message delivered at the regular session discussed the commercial, industrial and economic progress of the country and foreign affairs. Two important arbitration treaties were negotiated in July with Brazil and Great Britain. That with Brazil provided for arbitration by the Hague Court or other international tribunal to be established. The decisions rendered are to be final and without further recourse.

The principal items of legislation were a law for the consolidation of the national debt, which provided for the issuance of bonds for 31 years at seven per cent., and one levying increased export duties. The food situation was critical during the year and numerous measures were taken to remedy matters. A decree was issued restricting the export of prime necessities during the period of the war and ordering that these be sold for a fair and reasonable profit (April). An embargo was placed on the export of live stock and provision was made for the purchase of wheat in Australia (May). A decree of June 7 called for a general census in 1919 and established a central board to plan and carry out this work. In order to facilitate trade and commerce, President Pardo created a commercial board composed of representatives of the Government and various organizations interested in these lines. Much attention was given to the development of the natural resources of the country, especially those of coal and iron which would aid in industrial progress. The increasing number of Chinese and Japanese laborers coming to Peru caused an active propaganda for their exclusion to be carried on by the National Labor Union. The reasons for the opposition to the Asiatic immigration are the fact that the Orientals usually accumulate money and return to their native land and a dislike of amalgamation of the Peruvian and Asiatic races. A new immigration law was proposed which provides for the exclusion of foreigners deficient mentally, morally or physically, and places the power of regulation of admission in the hands of the executive. The notable progress in railway construction was continued in 1918. A National Pedagogical Congress was held in Lima in February.

Salvador.—President Carlos Meléndez was in charge of the executive power through the year. His message to Congress (February) dealt with the earthquake and relief measures, the admission of building materials free of duty, the development of agriculture, revenues and finance, and public instruction. In all lines the country was shown to be making progress. A boundary treaty and a postal money order convention were concluded with Honduras (*q. v.*). The latter was ratified with a view of facilitating and encouraging commercial transactions between the countries. The regular election of deputies to the national Congress took place on Jan. 13. The Supreme Court handed down a favorable decision respecting the new military code which was submitted by the Department of War. Two new features of this code are the adoption of conditional punishment and the establishment of a military law department. A mining law was published which declared mineral veins, deposits and outcroppings to be property of the state. This law was not intended to impair any rights legally established. Steps were taken by Congress to secure a revision of the mining code. A congress of workingmen representing organized labor, which was held in Armenia, discussed a closer union of interests and the betterment of the condition of the working classes. An active campaign was carried on through the year for the enforcement of sanitary regulations.

Uruguay.—President Feliciano Viera occupied the executive chair during 1918. In the Presidential election Dr. Baltasar Brum was chosen for the term beginning in 1919. President Viera in his message to Congress (Feb. 15) reviewed the international relations of the country, discussed the economic and financial conditions, and proposed the annual budget. Many international agreements were concluded by Uruguay in 1918. General obligatory arbitration treaties were signed with Great Britain and France (April). A treaty was drawn up with Argentina providing for the survey of the Uruguay River and the fixing of the boundary. A commercial treaty was entered into with the United States which aims to secure the consolidation of provincial and local taxes imposed on commercial travelers and the admission of samples without duty (October). Uruguay ratified the conventions of the Fourth Conference of American States relating to literary and artistic property, pecuniary claims, patents and trade-marks, and commercial marks (July). The convention relating to the betterment of the condition of the wounded and sick of armies in the field agreed to at Geneva in 1906 was also ratified (July). An agreement was reached between the chambers of commerce of the United States and Uruguay to use arbitration in the difficulties arising in international trade.

The question of food control was very important. A national food control board was established which fixed maximum prices on articles of prime necessity. An executive decree (February) prohibited the export of certain articles of prime necessity. The excellent wheat crop produced a surplus which allowed the repeal of the decree so far as this commodity was concerned. Another decree guaranteed exact weights to purchasers. Much important legislation was placed on the statute books. An educational law placed the complete control of primary education in the hands of the state. A currency law made the Bank of the Republic the only bank of issue and obliged it to redeem its notes in gold. A law was promulgated obliging employers to place chairs in all places where women work. Modifications of the eight-hour law were adopted which allowed a longer continuous period than eight hours but allowed no more than 48 hours in six days. A law was enacted placing a tax on real property. Congress authorized the issuance of 4,000,000 pesos in bonds for the public works debt. A bill was introduced in Congress relating to the formation of unions of employers or workmen. This had for its purpose the giving of a legal status to these organizations and the allowing of collective bargaining. A Physical Culture Technical Commission was formed by decree for the purpose of introducing and supervising programmes of physical exercises in the primary schools.

An important financial agreement was reached with England by which Uruguay advanced to the former a credit of 15,000,000 pesos at five per cent. This amount was to be used for the purchase of supplies in Uruguay, was guaranteed by bonds, and was payable in gold in Montevideo. This and other financial measures taken during the war have placed Uruguay in the column of creditor nations and indicate the sound character of the country's finance.

Venezuela.—The administration in Venezuela was controlled during 1918 in the same anamolous manner that has existed since 1915. V. Márquez Bustillos held the position of Provisional President while General Juan Vicente Gómez, the President-elect and the real power in the country, retained the post of Commander-in-Chief of the Army. In March the state legislatures chose the governors for the constitutional period 1918-21. Much important legislation was enacted. A law was passed relating to foreign corporations, making them subject to the laws and tribunals of the nation as are the national companies. The railway-concession law provided for contracts with the executive but without any guarantee of interest, prohibited the transfer of any concession to a foreign Government, and subjected the concessionaires to the laws of the country. Railways constructed under this law may import machinery free of duty for 25 years, secure timber from the forests, and construct private telegraph and telephone lines. A telegraph and telephone law placed the control of all systems of electric communication in the hands of the Government. An organic law of the national treasury, a law regulating taxes on salt mines, and a law taxing cigarettes were also passed. Progress was made along educational and industrial lines.

CANADA

Ernest H. Godfrey

End of the Great War.—The victorious conclusion of the great war by the signing of the armistice on Nov. 11 evoked popular demonstrations remarkable for spontaneity and originality of expression. When the war broke out on Aug. 4, 1914, Canada had a permanent force of only 3,000 men and an active militia of only 60,000. By the cessation of hostilities Canada had raised, equipped, and sent overseas 418,052 troops. At a secret session of both Houses of Parliament held on April 17—an event unprecedented in the history of the Dominion—a statement by the Prime Minister explained the extreme gravity of the war situation as then existing and the necessity for every possible effort on the part of Canada to keep the military divisions at full strength and to maintain and increase agricultural production. During the year, and especially since the successful resumption by the Allies of the offensive on the west front on July 18, the Canadian forces added new lustre to their previous glorious achievements (see *The European War, infra*). Nearly 10,000 awards for gallantry or distinguished service have been made to Canadian soldiers during the war. Up to Dec. 31, 1918, the casualties among the Canadian forces numbered 9,989 officers and 204,397 of other ranks; they included:

	Officers	Other Ranks
Killed in action and died of wounds	2,456	45,630
Died of diseases	220	5,185
Wounded	7,130	148,669
Presumed dead	142	4,529
Missing	41	384

In addition, prisoners of war numbered 3,575, of whom 2,508 have been repatriated, have escaped or have died while prisoners of war. Deaths in Canada numbered 2,221.

Canada has taken a prominent part in the manufacture of munitions of war. The total value of war orders placed in Canada by the Imperial Government is about $1,200,000,000, and of this amount half was lent by the Dominion to the British Government. As many as 350,000 men and women have been employed in Canada on this work. The value of the free gifts of the people of Canada for war purposes, including the Patriotic and Red Cross Funds and a great variety of other agencies and Allied relief funds, is estimated at about $90,000,000, or over $11 *per capita* of the total population.

Problems that have engaged serious attention during the year have been the reabsorption into civil life of returned soldiers, especially of those incapacitated by wounds or sickness, and the demobilization of armies in the field. To cope with the former a new Soldiers' Civil Reestablishment Department of the Dominion Government has been established, subsidiary to which is the Invalided Soldiers Commission, replacing the Military Hospitals Commission. Complete arrangements for demobilization cannot be effected until the conclusion of peace, but meanwhile detachments of the Canadian overseas troops are returning to Canada at the rate of about 20,000 per month. A Khaki University of Canada, for continuing the education of young soldiers whose studies were interrupted by the war, has been established overseas.

From June 12 to July 26 meetings of the Imperial War Conference took place in London, being held as a rule on alternate days to those of the meetings of the Imperial War Cabinet, upon which Canada was represented by the Prime Minister (Sir Robert Borden). The Canadian representatives at the Imperial War Conference were Sir Robert Borden, Arthur Meighen, Minister of the Interior, and N. W. Rowell, President of the Privy Council (see also *The United Kingdom, infra*).

Dominion Legislation. — The first session of the 13th Parliament was held at Ottawa, March 18 to May 24, during which 52 public and 44 local and private acts were passed. In addition to the acts imposing fresh taxes, as described below, the following measures were passed. Chapter 3 constitutes a new Department of Immigration and Colonization, and the duties hitherto fulfilled by the Immigration Branch of the Department of the Interior are transferred to it. Chapter 42 creates the Soldiers Civil Reëstablishment Department. Chapter 6 authorizes the Governor in Council to transfer duties from one Minister or Department to another and to combine two or more Departments under one Minister. Under this Act the Inland Revenue has been amalgamated with the Customs under the administration of the Customs and Inland Revenue Department; and other changes have been made by transfer to the Department of Trade and Commerce of duties hitherto undertaken by the Departments of Inland Revenue and Agriculture. Chapter 36 provides for the appointment of a Superintendent of Penitentiaries and Chapter 43 constitutes the Dominion Bureau of Statistics under a Dominion Statistician. The Civil Service Act (Ch. 12) abolishes patronage throughout the civil service, and provides for organization, conditions of appointment and promotion, increased rates of pay, etc., in the inside and outside services of the Dominion Government. The civil service commissioners are increased from two to three, and are directed to prepare plans for the organization of the inside and outside services of each Department, following the same general principles in all branches. The Daylight Saving Act (Ch. 2) provided for the clocks of the Dominion to be advanced for one hour during the summer months (April 14 to Oct. 27). Other acts relate to the electoral franchise for women (Ch. 20), the administration of justice (Ch. 7), amendment of the Criminal Code (Ch. 16), labor (Chs. 21 and 27), increased compensation under the Animal Contagious Diseases Act (Ch. 8), Dominion lands and forests (Chs. 4, 19 and 40), railways (Chs. 38 and 39), public works (Chs. 33 and 37), companies (Chs. 13 and 14), the Patriotic Fund (Ch. 35), naval discipline (Ch. 34), fisheries (Ch. 22), zinc bounties (Ch. 51), bills of exchange (Ch. 9), gold and silver marking (Ch. 23) and Indians (Ch. 26).

Taxation.—Additional taxation was imposed by Chapters 17, 25, 28 and 46. An Act to amend the Income War Tax Act 1917 (*A. Y. B.*, 1917, p. 87) lowers the limit of exemption by providing for a tax of two per cent. on incomes exceeding $1,000 but not exceeding $1,500 by unmarried persons and childless widowers and widows and on incomes exceeding $2,000 but not exceeding $3,000 by other persons. The supertax is increased on incomes exceeding $200,000, being graduated up to 50 per cent. on incomes exceeding $1,000,000. There is further a surtax progressing from five per cent. of the normal tax and supertax on incomes exceeding $6,000 but not exceeding $10,000 up to 35 per cent. of this amount on incomes exceeding $200,000. Income to the amount of $200 for each dependent child is exempt from taxation. Corporations and companies are to pay a tax of six per cent. on income in excess of $3,000, but no supertax or surtax. The import duties on coffee, tea, tobacco, etc., are increased by the Customs Tariff Amendment Act (Ch. 17). The new duties per pound are as follows: green coffee and chicory, five cents under the British preferential tariff and seven cents under the international and general tariffs; on roasted or ground coffee and chicory, eight cents and 10 cents; on coffee extracts, nine cents and 12 cents; on tea under both tariffs, 10 cents; on cigars and cigarettes under both tariffs, $4.10 per pound and 25 per cent. *ad valorem;* on manufactured and on cut tobacco, 90 cents per pound; on beverages made from malt, etc., and containing not more than 2½ per cent. of proof spirits, 25 per cent. and 40 per cent.; on motion-picture films, two cents and three cents per linear foot. Excise duties payable under the Act to amend the Inland Revenue Act (Ch. 28) are: tobacco and snuff, 20 cents per pound; cigars, $6 per 1,000, or in packages of less than ten, $7 per 1,000; on cigarettes weighing not more than three pounds per 1,000, $6 per 1,000; weighing more than three pounds per 1,000, $11; on foreign leaf tobacco, unstemmed, 40 cents per pound, stemmed, 60 cents. Tobacco growers in Canada are to be licensed and are to pay a duty on the tobacco grown of five cents per pound with an exemption of 30 lb. for the grower's own use. The Act to amend the Special War Revenue Act 1915 (Ch. 46) (*A. Y. B.*, 1915, p. 135) imposes the following increased or new taxes: for each seat or berth in a parlor or sleeping car, 10 cents and 10 per cent. of the price of the seat or berth; one cent on every 100 matches and eight cents on every package of 54 or fewer playing cards, with customs duties of the same amount on these articles when imported; 10 per cent. of the selling price on passenger automobiles, gramophones, etc., and records, mechanical piano players and records, and jewelry.

Provincial Legislation. — A large number of new acts was passed by the legislatures of the nine provinces. The majority of them need not here be particularly described, but acts relating to the movement for better roads, prohibition and temperance, public health, and one or two other subjects are of more than local interest. New Brunswick provides (Ch. 8) for the construction and maintenance of highways; the roads of the province are to be divided into trunk roads and branch roads and the act imposes a road tax. Quebec enacts (Ch. 11) that the Minister of Roads may declare a road to be a main communication road and order repairs and improvements to be made at the expense of the municipality interested, and confers powers of expropriation for the widening or alteration of main communication roads. In Ontario (Ch. 16) $1,000,000 is set apart for aid in the improvement of highways. Alberta provides (Ch. 14) for the control of highways by the Minister of Public Works and distributes the cost of construction and maintenance between the provincial and local authorities. Quebec (Ch. 23) enacts that no license shall be issued after May 1, 1919, for the sale of intoxicating liquors, excepting wine for sacramental use and alcoholic liquors for medical, mechanical or industrial purposes; provision is made for the licensing of temperance hotels. The Ontario Temperance Amendment Act, 1918 (Ch. 40) amends the definition of a private dwelling house and provides that the house of an inhibited person shall not be a private dwelling; that drunken men and sellers of liquor may be arrested without warrant; that a medical practitioner may keep ten gallons of liquor; that essences and flavoring extracts shall be sold retail in bottles of not more than 2½ oz.; and that the owner of any liquor may transport it from one place to another where it may be lawfully kept. Alberta (Ch. 8) makes regulations concerning manufacturers and sellers of liquor under license from the Dominion Government. Acts relating to forest lands were passed in New Brunswick, Quebec, Ontario, Saskatchewan and Alberta. Those of New Brunswick and Ontario include special forest fire prevention acts. In Prince Edward Island (Ch. 3), New Brunswick (Ch. 5), and British Columbia (Ch. 92) statutory authority is given for the appointment of members of the provincial bar as commissioners for the promotion of uniformity of provincial legislation, the provincial commissioners, together with representatives of the Canadian Bar Association, to form a National Conference of Provincial Commissioners to examine legislation with this end in view.

Decrease of Drunkenness.—Already the effect of the prohibitory legislation of the past two or three years is beginning to tell in a decrease in convictions for drunkenness. The latest report on criminal statistics records that the number of summary convictions for drunkenness in Canada was 27,882 in 1917, as compared with 32,730 in 1916, a decrease of 4,848, or nearly 14.81 per cent. Drunkenness decreased during 1917 in every province excepting Quebec and British Columbia, the former province showing an increase of 917, or nearly 13 per cent., in the number of convictions, and the latter a smaller increase of 45, or close on 2 per cent. The ratio of decrease is most marked in Alberta (78 per cent.), in Manitoba (65 per cent.) and in the Yukon (53 per cent.). In the other provinces the percentage decreases range from 29½ per cent. in Nova Scotia to 5½ per cent. in Prince Edward Island.

Agriculture and Live Stock.—Excluding tidal waters, the total area of Canada is computed to be 2,386,985,600 acres, of which 80,483,200 acres are water. Of the land area, according to the census of 1911, nearly 110 million acres were occupied and 48½ million acres were improved, while in 1910 about 30½ million acres were in field crops. Since then the area under field crops has gradually expanded, especially during the war; in 1918 the total area returned as under field crops was 51,445,000 acres, as compared with 42,602,288 acres in 1917. The season of 1918 for grain was disappointing, especially after the hopes aroused by the early seeding of a greatly increased area. In June, cold and high winds caused drifting in the prairie provinces, and much land sown to wheat had to be reseeded to other grains. A long spell of drought, with exceptionally severe night frosts from July 23 to 26, greatly damaged the prairie grain crops and resulted in very low average yields per acre, especially in Saskatchewan, the chief wheat-growing province. In the three Atlantic prov-

ACREAGE, PRODUCTION, AND VALUE OF FIELD CROPS, 1917–18

(In Thousands)

Crops	Acreage		Production		Value	
	1917	1918	1917	1918	1917	1918
			Bushels	*Bushels*		
Fall wheat	715	417	15,533	7,943	$32,337	$16,516
Spring wheat	14,041	16,937	218,210	181,132	420,702	365,162
All wheat	14,756	17,354	233,743	189,075	453,039	381,678
Oats	13,313	14,790	403,010	426,313	277,065	331,357
Barley	2,392	3,154	55,058	77,287	59,655	77,379
Rye	212	555	3,857	8,504	6,267	12,729
Peas	199	236	3,026	3,099	10,724	7,873
Beans	92	229	1,274	3,563	9,493	19,284
Buckwheat	396	548	7,149	11,376	10,443	18,018
Flax	920	1,068	5,935	6,055	15,737	18,951
Mixed grains	497	922	16,157	35,662	18,802	40,727
Corn for husking	234	250	7,763	14,214	14,307	24,903
Potatoes	657	735	79,892	104,364	80,804	102,235
Turnips, etc	218	343	63,451	122,700	29,253	52,252
			Tons	*Tons*		
Hay and clover	8,225	10,545	13,685	14,772	141,377	241,277
Fodder corn	367	502	2,690	4,788	13,835	29,439
Alfalfa	110	196	262	446	3,041	7,964
Sugar beets	14	18	118	180	794	1,845
Total	42,602	51,445	....	....	$1,144,636	$1,367,911

inces and in Quebec conditions were generally excellent, except for an unusually wet September. Ontario for the second year in succession enjoyed an abundant harvest of practically all crops. The area planted to potatoes in Canada was again the largest on record, and though the yield per acre was slightly below average, it was decidedly superior to that of 1917 and resulted in the record total yield of over 104 million bushels. Fodder crops (hay, clover, roots and corn) gave excellent returns. In the accompanying table are given the areas, yields and values of the field crops of 1918, as compared with 1917. The figures for 1918 are final estimates, but their comparability with the final returns of 1917 is somewhat affected by an improved method for the collection of annual agricultural statistics which was applied throughout Canada in 1918 by the Dominion and provincial governments.

The following were the estimated numbers of farm live stock in Canada on June 15, 1918, as compared with 1917:

	1917	1918
Horses	3,412,749	3,609,257
Milch cows	3,202,283	3,543,600
Other cattle	4,718,657	6,507,267
Total cattle	7,920,940	10,050,867
Sheep	2,369,358	3,052,748
Swine	3,619,382	4,289,682

In addition, the statistics of farm live stock in 1918, also collected by the improved system above referred to, included 10,261 mules and 34,149,691 poultry, comprising 31,324,498 fowls, 1,061,982 turkeys, 879,177 geese and 884,034 ducks. Canadian creameries and cheese factories in 1917 numbered 3,418 and produced 87,404,366 lb. of creamery butter of the value of $34,227,188 and 194,904,336 lb. of factory cheese of the value of $41,170,563. The production exceeded that of 1916 by 4,840,236 lb. of butter and 1,935,739 lb. of cheese. Creamery-made butter represents about 68 per cent. of the total production, the rest being dairy butter made on farms. All but about one per cent. of the cheese is factory-made. The total value of the field crops of 1918 is placed at about $1,367,911,000, as compared with $1,144,636,450 in 1917 and with $552,771,500, the pre-war value in 1913. For live stock the total estimated value in 1918, based on 1917 prices, is about $1,285,650,000 as compared with $725,530,000 in 1914. Official calculations place the gross total value of the agricultural production of Canada in 1917 at $1,621,028,000. Adding $2,792,229,000 for land, $927,548,000 for buildings, $387,079,000 for implements and $1,102,261,000 for live stock, the total agricultural wealth of Canada in 1917 is estimated at $6,830,145,000.

Trade, Revenue, and Finance.—For the year ended Mar. 31, 1918, the value of the aggregate external trade of Canada was $2,548,713,538, as compared with $2,024,567,406 in 1916-17 and $1,287,117,229 in 1915-16. As compared with 1916-17, the increase is $524,146,132, or nearly 26 per cent., and as compared with 1915-16 the increase is $1,261,596,309, or 98 per cent. In 1917-18 the trade of Canada with the United States was $1,233,397,045, as compared with $954,798,426 in 1916-17, and with the United Kingdom $942,397,682, as compared with $863,167,643. For the 12 months ended Dec. 31 the value of the total trade of Canada was $2,236,663,144, as compared with $2,552,412,571, the corresponding total for 1917. For the fiscal year ended March 31, 1918, the revenue on Consolidated Fund Account attained the record total of $260,778,953, and the expenditure was $178,284,313, leaving a surplus of $82,494,640. The revenue received was sufficient to meet all ordinary and capital outlays, including an increased amount for interest and pensions, and the surplus was applied to war expenditures. The receipts from customs in 1917-18 amounted to $144,172,630, which was more than half the total revenue and more than what the total pre-war revenue was in 1914-15. For the nine months ended Dec. 31, 1918, the revenue was $222,485,552, as against $190,659,370 for the corresponding period of 1917. The expenditure on account of the war since August, 1914, is well over one billion dollars, the amount standing on Oct. 31, 1918, at $1,046,844,000. On March 31, 1918, the net public debt of Canada was $1,191,884,063, as compared with $879,186,298 on March 31, 1917. Before the war, on March 31, 1914, the amount stood at $335,996,850. On the basis of the estimated population at March 31, 1918, *viz.*, 8,593,000, the *per capita* indebtedness was $138, as against $62 in 1914. On Dec. 31, 1918, the net debt of the Dominion had increased to $1,330,228,898. On Oct. 28, the fifth Canadian War Loan, popularly known as "Victory bonds," was issued by the Dominion Government. The loan was for $300,000,000 5½ per cent. gold bonds for five years maturing Nov. 1, 1923, and 15 years maturing Nov. 1, 1933, in denominations of $50, $100, $500 and $1,000, issued at par and free of taxes. The bonds were the subject of a very vigorous publicity campaign throughout Canada, which set a definite objective for each province with the total for Canada at $500,000,000. The success of the campaign was such that, in spite of the signing of the armistice on Nov. 11 and the difficulties caused by the influenza epidemic, every province exceeded the amount aimed at, and the total subscription by the time of the closing of the lists on Nov. 16 reached the sum of $676,057,867. By order-in-council of Dec. 10, the issue of $50,000,000 in war savings stamps on terms similar to those in the United States was authorized.

Canadian Trade Commissions.—Under order-in-council of Nov. 7, a Canadian Trade Mission was established in London to have extensions in France, Belgium and Italy. An order-in-council of Dec. 6 appointed a Canadian Trade Commission with headquarters at Ottawa to coöperate with the Canadian Mission in London. Under order-in-council of Oct. 21, a Canadian Commercial Commission for Siberia was appointed to proceed to Vladivostok to represent Canadian commercial interests and to promote commercial interchanges between Canada and Russia.

Epidemic of Spanish Influenza.—During the months of September, October and November, the Dominion was visited by a severe epidemic of Spanish influenza, which had already exacted a heavy toll of life in European and other countries. For several weeks from the first week of October, churches and theatres were closed and public meetings abandoned. These and other precautions appear to have had some effect in mitigating the effects of the plague, but not before a distressingly large number of fatalities, especially amongst the younger members of the community, had occurred from the disease and its attendant complications.

THE BRITISH EMPIRE

Annie G. Porritt

THE UNITED KINGDOM

Parliament and Electoral Reform.—At the opening of 1918 the Electoral Reform bill which had passed the House of Commons in December, 1917, was still before the House of Lords. and before it became law on Feb. 6 there was some conflict between the House of Commons and the House of Lords on the questions of proportional representation and the alternative vote. Proportional representation had been three times voted down in the House of Commons, which, as a compromise, had adopted a scheme for an alternative vote in those cases where there were three candidates for one seat. Twice the Lords threw out the alternative vote and added an amendment to the bill embodying a scheme of proportional representation, and twice the Commons rejected the amendments and restored their own provision. Finally, on Feb. 6, which had been set as the date of the prorogation of Parliament, the Lords made a third and greatly modified proposal for proportional representation, while they again rejected the provision for the alternative vote. This time the Commons, who were anxious to save the bill, agreed with the Lords' amendment and refrained from pressing the question of the alternative vote; and immediately thereafter the bill received the royal assent.

The last and successful attempt of the Lords to introduce proportional representation was embodied in an amendment moved by Lord Lansdowne. It provided that the King might appoint commissioners to prepare a scheme under which about 100 members of the House of Commons might be elected at a general election on the principle of proportional representation for constituencies returning three or more members. "If both Houses, by resolution, shall adopt the scheme," it shall, with any modifications made in it by both Houses, take effect as though it were part of the Act. This compromise left the House of Commons free to adopt or reject the scheme if the Cabinet at any time chose to appoint the commissioners and have the scheme formulated.

In addition to the changes made by the Act in the franchises on which members were elected and in the distribution of seats (*A. Y. B.*, 1917, p. 91) the Act makes important changes in the machinery of registration and in the holding of elections. Two registers of electors are to be prepared each year (one in the spring, the other in the fall), and the town clerk of the borough or the clerk of the county council is made the registration officer, instead of the duty of registration falling on the poor-law authorities, as formerly. Any appeal from the decision of a registration officer is to lie to the county court, or a further appeal on a point of law to the Court of Appeal, whose decision is final.

Nomination day and polling day were made uniform all through the United Kingdom, but eight days might be allowed after polling day for the counting of the votes of absent electors, who were allowed to send their ballots by mail with a declaration of identity. Voting by proxy was permitted in the case of naval and military voters in distant areas, merchant seamen, pilots, and fishermen at sea. The old system of plural voting was swept away, but a voter was still permitted two votes, one for his residence and another either on his university franchise or as occupier of business premises. All official expenses connected with an election were thrown on the Treasury, and each candidate was allowed a limited franking privilege for the sending of a statement of his platform and claims to his constituents. The disqualification consequent on the receipt of poor-law relief was swept away. On the other hand, conscientious objectors were disqualified during the war and for a period of five years afterwards, unless they satisfied the Central Tribunal that they had been engaged in work of national importance. By an amendment added by the Lords, six more university constituencies were created, making the whole number of university members 15. These members, in all cases where a university returned more than one member, were to be elected by proportional representation. Two more university members were allotted to Ireland, making her full quota 105. The unit of representation in Great Britain was one member to 70,000 population; in Ireland, one member to 43,000. The total membership of the House of Commons was raised to 707.

The Education Act.—Aside from the measures necessary for the carrying on of the war, the only other outstanding Act of Parliament was Herbert Fisher's Education Act. The Education bill introduced in 1917 was eventually withdrawn. (*A. Y. B.*, 1917, p. 92.) Early in the session of 1918 it was reintroduced in an amended form, and after considerable amendment in the House of Commons and an easy passage through the House of Lords, it became law on Aug. 7. Briefly summarized, the principal changes effected by it in the British system of education are as follows:

1. Compulsory attendance at school without exemptions for all children between the ages of five and 14.
2. Permission given to local authorities to raise the age of compulsory attendance to 15.
3. Compulsory attendance at continuation schools from 14 to 16 years of age until 1925, and after 1925 from 14 to 18 years of age. This attendance must be all day if the children are not at work. If at work, the children must attend for eight hours a week, to be counted as of their working hours. The education to be given in the continuation schools is to be liberal, not vocational.
4. No child under 12 to be allowed to work for wages.
5. Children between 12 and 14 may be employed for not more than two hours on Sunday or any school day, but they may not be employed before 6 a. m. or after 8 p. m. Permission is given to local authorities to limit the time of employment of children between 12 and 14 to one hour before school in the morning and one hour after school in the afternoon.
6. Local authorities may provide holiday or camp schools, physical-training centers, swimming baths, and other facilities for physical training and social life, part of the cost of which will be borne by the Imperial Treasury.
7. Medical inspection and treatment of pupils in all schools supported out of public money provided for.
8. Local authorities may provide nursery schools for children between the ages of two and six.
9. Special schools to be established for physically defective children.
10. All fees in public elementary schools abolished.

The Act also includes a number of provisions relating to the duties of the local education authorities and the distribution of Government grants. The generous help to be given by the central Government is in general made contingent on the proper performance of their duties by the local authorities. The Act has been characterized as the first English education measure whose primary object was the care and education of the children of England and not the settlement of religious disputes and differences.

The Man Power Act.—The need for more men for the armies made it necessary to appeal to Parliament in January for legislation which would enable the Government to draft about half a million more men. A bill introduced on Jan. 14 had two main objects—to abolish certain exemptions for definite periods of time which had been granted to applicants under former legislation, and to give power to withdraw exemption certificates granted on the score of occupation. The bill met with considerable opposition from the trade unions, but delegates from the unions were received by Lloyd George, who went into a full explanation of the bill and of the reasons for its introduction. At this time the contribution of the Empire to the British armed forces was estimated at 7,420,000 men, of whom 1,000,000 had been sent by India and the African and other dependencies, and 6,420,000 were from the United Kingdom and the self-governing Dominions. The quotas were as follows:

	Number	Per Cent.
England	4,530,000	60.0
Scotland	620,000	8.3
Wales	200,000	3.7
Ireland	170,000	2.3
The Dominions	900,000	12.0

On April 8 the Government had again to go to Parliament for more men, and the Prime Minister introduced a Military Service bill which was put through all its stages and became law in 10 days. By this Act the military age was raised from 41 to 50 years. Certain exemptions were swept away, including the absolute exemption of ministers of religion, who were not, however, to be called upon for combatant service against their will. The Act also extended compulsory service to Ireland, which had not been included in former measures. This provision of the bill was, however, never carried out. (See "Ireland," *infra.*)

The General Election.—The House of Commons which was elected in December, 1910, was still in existence at the conclusion of the armistice with Germany on Nov. 11, 1918, its life having been extended in July, for the fourth time, to Jan. 30, 1919. Immediately after the armistice it was announced that Parliament would be dissolved on Nov. 25 and that a new House of Commons would be elected on Dec. 14. By a short act put through Parliament after this announcement, the time for the counting of the votes was extended to Dec. 28, in order to allow for the receipt of votes by mail from the soldiers in France and Belgium.

The election was a tremendous triumph for Lloyd George, whose coalition Government was returned to power by the overwhelming majority of 273. In Ireland the Nationalists were almost wiped out, and the Sinn Fein obtained 73 out of the 105 seats.

The figures were as follows:

GREAT BRITAIN:	
Coalition: Unionists	338
Liberals	136
National Democrats	11
Total	485
Labor	61
Independent Unionists	28
Liberals	26
IRELAND:	
Sinn Fein	73
Nationalists	7
Unionists	27
Total	107
Total	707

Of the 16 women candidates only one, Countess Markieviecz, Sinn Fein, was elected. Mr. Asquith and all his ex-ministerial colleagues were defeated, as were also all his House of Commons whips; and the Liberal party with only 26 members lost its position as the official opposition, a position that was taken by the Labor Party with 61 members.

The number of votes recorded was 10,679,020 out of a total of 21,373,424; England and Wales, 8,493,656; Scotland, 1,139,322, and Ireland 1,046,042. There were, however, 107 constituencies with a total electorate of 3,081,266 in which members were returned unopposed. Out of the 10,679,020 votes cast, the Government obtained 5,785,906, and the opposition parties 4,839,144, giving a Government majority in the popular vote of 1,575,299.

The Administration. — There were several changes in the Ministry during the year, but Lloyd George remained Premier and succeeded in retaining the support of the majority in the House of Commons. Sir Edward Carson resigned from the War Cabinet in January and devoted himself to the leadership of the Ulster opposition to Irish home rule. The Earl of Derby relinquished his portfolio as Secretary for War to go as Ambassador to Paris; he was succeeded by Viscount Milner. Austen Chamberlain took the place of Lord Milner as minister without portfolio in the War Cabinet. Other outstanding changes were the substitution of Edward Shortt for Mr. Duke as Chief Secretary for Ireland; the succession of J. R. Clynes to the Ministry of Food Control on the resignation of Baron Rhondda; and the resignation of Sir Edward Cave as Home Secretary. After the announcement of the dissolution of Parliament Mr. Clynes and Lord Robert Cecil both resigned.

Several times Lloyd George had to meet and surmount acute parliamentary crises. One of these occurred in February over the resignation of Sir William Robertson as Chief of Staff. Another was brought on in May by the publication of an open letter by Gen. Sir F. Maurice, in which he asserted that certain statements made by Lloyd George about the army and about the support given to Marshal Haig were inaccurate and misleading. There was, however, no desire on the part of either Parliament or the country to change leaders, and Lloyd George was supported by large majorities in divisions that were practically votes of confidence.

Reform of the House of Lords.—A somewhat fainthearted effort to deal with the reform and reorganization of the House of Lords was made during the year. A conference on the question, with Lord Bryce as its chairman, was appointed by the Prime Minister, and its report was published at the end of April. The conference rejected proposals for election on the basis of property qualification; election from prescribed categories; nomination by the Cabinet; selection by a joint committee of both houses. The plan recommended was the election of 246 members by the House of Commons, the House for electoral purposes to be divided into territorial groups; and the election of 81 members from the Peers by a joint committee of both houses. It was recommended that the House of Lords be made definitely subordinate in powers to the House of Commons and that provision be made for free conferences to settle points of disagreement between the two houses.

Finance.—Andrew Bonar Law's second war budget was introduced in the Commons on April 22. The financial statement with which the Chancellor prefaced his proposals for new taxation was on a scale far exceeding any previously made in Great Britain, or indeed in any other country. The principle on which Mr. Law framed his budget was that the revenue ought to cover all peace expenditures and also the increased debt charge. The total expenditures for the year ending March 31, 1919, Mr. Law estimated at £2,972,197,000; on this principle there would be required, in addition to the revenue of £774,250,000 on the present basis of taxation, further revenue to the amount of £67,800,000 from new taxation. This would make a total income from taxation of £842,050,000; the remainder of the expenditures, £2,130,147,000, would have to be raised by loans. Mr. Law stated that the total expenditures for 1917-18 were £2,696,221,000; the income from taxation and all other sources, excluding loans, was £707,235,000; and the loans contracted during the financial year amounted to £1,989,986,000. There had been an excess of £68,625,000 of revenue over the revenue estimates of the budget of 1917, chiefly from excess-profits and income taxes.

As to new taxation Mr. Law announced an increase in the income tax from 5s. to 6s. in the pound; the whole of this increase did not become operative until incomes of £2,500 were reached, and the rates on incomes of £500 and under were left as before, at 2s. 3d. on earned incomes and 3s. on unearned incomes. The farmer was assessed on an income assumed to be double the amount of his rent, instead of equal to his rent as formerly. The supertax limit of incomes was lowered from £3,000 to £2,500 and the rate of supertax graduated from 1s. to 4s. 6d. instead of from 10d. to 3s. 6d. There were increases in the taxes on spirits and beer, tobacco, matches and sugar, and also in postal rates. The chief novelty of the budget, however, was the luxuries tax—a tax of 2d. in the shilling of the amount expended on luxuries. The principle adopted was borrowed from French practice. Under it luxuries are grouped under three heads: (1) articles of luxury as such, apart from the question of price, such as jewelry; (2) articles above a certain price, when they become articles of luxury; (3) luxury establishments, such as hotels and restaurants. The tax was to be collected by means of stamps, paid for and affixed by the customer and collected by the seller. Occasional inspection was provided for as a check on possible collusion. A select committee of the House of Commons was appointed to report a scheme for the imposition of this tax.

The votes of credit asked of the House of Commons by the Government in 1918 were for a total amount of £2,500,000,000. The first was for £600,000,000 on March 7; the second for £500,000,000 on June 18; the third for £700,000,000 on Aug. 1; and the fourth for £700,000,000 on Nov. 18. The total of the votes of credit for the period of the war was as follows:

1914-15	£362,000,000
1915-16	1,420,000,000
1916-17	2,010,000,000
1917-18	2,450,000,000
1918	2,500,000,000
Total	8,742,000,000

The greater part of the votes of credit was added to the British National Debt, which at the end of 1918 must have stood at almost £10,000,000,000. At the end of the financial year 1917-18 the amount of the debt was £7,980,000,000. But, as Mr. Law pointed out, there were some important deductions to be made from this gross amount. These deductions included £1,322,000,000 which had been loaned to the Allies. Of this amount £568,000,000 represented the loans to Russia, which at that time looked like a bad debt. In addition there were loans of £194,000,000 to the Dominions. Until the United States came into the war, the financing of the Alliance had largely fallen on Great Britain. "The assistance given by the British Treasury to the Alliance," Mr. Law told the House of Commons, "was like the Navy—it was so silent. Up to the time America came into the war the financial assistance given by the British Government was as vital to the continuance of the war as the British Navy." Mr. Law frankly acknowledged the great financial assistance which had been given by the United States. During the year 1917-18 the advances by Great Britain to the Allies had been £505,000,000. In addition to this the United States had advanced to all the Allies no less a sum during the year than £950,000,000. (See also XIII, *Public Finance.*) Of this approximately £500,000,000 was advanced to Great Britain and £450,000,000 to the Allies. Mr. Law added:

> The House would notice that our advances to the Allies are approximately the same amount as the advances made to us by the Government of the United States. This is satisfactory. It means that it is only necessary for us to lean on the United States to the extent that the other Allies lean upon us, or that, in other words, after nearly four years of war, we are self-supporting.

The Imperial War Cabinet.—The second session of the Imperial War Cabinet (*A. Y. B.*, 1917, p. 95) opened on June 11, and the Cabinet remained continuously in session for two and a half months. At the opening session, at which Mr. Lloyd George presided, there were present Mr. Law, Lord Curzon, Austen Chamberlain and C. N. Barnes of the British Cabinet; Sir Robert Borden, A. Meighen, J. Calder, N. Rowell and Sir A. E. Kemp from Canada; W. F. Massey and Sir Joseph Ward from New Zealand; Gen. J. C. Smuts and H. Burton from South Africa; W. F. Lloyd, the Prime Minister of Newfoundland; and the technical advisers of the Imperial War Cabinet representing the Navy, the Army, and the Air Service. The Australian representatives, who did not arrive in time for the first meeting, were W. M. Hughes, the Prime Minister, and Joseph Cook. At the later sessions, India was represented by E. S. Montagu, the Secretary of State for India, and Sir Satyendra P. Sinha, the representative nominated by the Viceroy. To represent the Indian States the Government also invited the attendance of the Maharaja of Patiala. During the session of the Imperial War Cabinet every aspect of policy affecting the conduct of the war and the questions of peace was examined and debated, and the meetings were found of so much value that it was decided to establish direct communication between the Premiers of the Dominions and the Imperial Prime Minister instead of as formerly through the Governors-General and the Colonial Office.

Side by side with the meetings of the Imperial War Cabinet were held meetings of the Imperial War Conference—the Colonial Conference—at which problems concerning the colonies were considered. Among the questions which came before the Conference was that of the settlement of ex-service men. The Conference went on record in favor of arrangements by which intending emigrants from the United Kingdom might be induced to settle in countries under the British flag, and advised the formation of a consultative committee formed of representatives from the Dominions to assist the British Government in arranging for such emigration. Other questions considered included better and cheaper cable communication between Great Britain and the colonies; the conservation and development of imperial mineral resources; preferences in Government contracts for Empire raw materials; and the establishment of an Imperial Court of Appeals as the supreme tribunal for the whole Empire.

Labor.—During 1918 considerable friction developed between the Labor

Party as a political organization and the trades unionists. This friction was due partly to the broadening of the Labor Party and the admission to it of all who worked with hand or brain and subscribed to its principles, and partly to the dominance in the Labor Party of the socialists. A conference of the Labor Party was held in London in January, at which was presented a programme calling for the reconstruction of society on a new social order based on four principles: (1) the universal enforcement of the national minimum; (2) the democratic control of industry; (3) a revolution in national finance; and (4) the surplus wealth for the national good. The national minimum, which the Labor Party demanded should be enforced by the Trade Boards Act, called for a minimum wage for men or women workers of 30s. a week. The programme also called on the Government to make provision against unemployment at the end of the war by putting in hand at once much needed public works, such as the outlay of £300,000,000 annually on the rehousing of the nation, and demanded that means should be taken to relieve an overstocked labor market by raising the school-leaving age to 16, increasing the facilities for higher education for the working classes, and shortening the hours of labor both of adults and young people, the eight-hour day being demanded for adults. The programme further called for the complete democratisation of the government of the United Kingdom, including the abolition of the House of Lords, and demanded also the progressive elimination from the control of industry of private capitalists, individual or joint stock, and a genuinely scientific organization of the nation's industry

> no longer deflected by individual profiteering, on the basis of the common ownership of the means of production; the equitable sharing of the proceeds among all who participate in any capacity, and only among these, and the adoption, in particular services and occupations, of those systems and methods of administration and control that may be found, in practice, best to promote the public interest.

In particular the immediate nationalization of the railways and canals and of the great steamship lines was demanded, as well as the erection by the Government of great power stations generating electricity for the use of the whole country. In finance the programme demanded such a system of taxation as would not encroach in any way on the national minimum, and the raising of the greater part of the revenue by graduated income taxes. In regard to the fourth principle it was proposed to prevent the passing on of huge fortunes by the appropriation by the Government of all but a very moderate allowance of the wealth accumulated by any man during his lifetime.

As propaganda this programme exercised an immense influence on the thought of England, and parts of it were adopted by Lloyd George in his reconstruction proposals. It was opposed by certain sections of the trade unionists, and at the Trade Union Congress held in Derby in September an attempt was made to split the Labor Party and make a separate and strictly trade-union party, uncontrolled by socialists. The movement for this new party was headed by Havelock Wilson, president of the Seamen's and Firemen's Union, in June, at the time of a Labor Party Conference in London at which Kerensky made an unexpected appearance. At this conference it was voted two to one in a vote of 2,655,000 to end the political truce in order to free the party to fight for labor candidates in the coming general election. The vote in the Trade Union Congress on Sept. 7 on the question of a new trade-union party resulted in a defeat of Mr. Wilson's motion by 3,815,000 to 567,000. There was a feeling among the trade unionists, however, that this vote had not settled the question and that the *bona fide* trade unionists might still choose to secede from the Congress.

There was much restlessness and uneasiness in the labor world during the year, and in September especially this restlessness culminated in a series of strikes which affected shipbuilding, the London bus and other transportation companies, the police and firemen of London, the cotton operatives of Lancashire and the railways of the Welsh and Southwestern systems. There was, however, at no time any doubt of the position of British labor towards the war. (See also XIV, *Socialism.*)

Food.—Under the excellent management of Lord Rhondda the food question which was acute at the end of 1917 (*A. Y. B.*, 1917, p. 93) gave much less trouble in 1918. A scheme of compulsory rationing was put in force in London and the home counties on Feb. 25; on April 7 it was extended to the whole country and made to cover sugar, butter, margarine, lard, and meat. Tea was rationed in some towns but not in London. To keep down the price of bread a large subvention was paid by the Government to the millers and bakers. Lord Rhondda died on July 3; he was succeeded by J. R. Clynes and the system was continued without complaint or difficulty.

Women.—The part of women in the national life of Great Britain was increasingly recognized throughout 1918. In January the Electoral Reform Act gave the vote to some six million Englishwomen in Parliamentary elections and added five millions to the number of local-government women voters. The excellent work done by the Women's Auxiliary Army Corps ("Waacs") brought about the organization in January, 1918, of the Women's Royal Navy Service ("Wrens") and a little later of the Women's Royal Air Force ("Penguins"). The women showed themselves fully conscious of their new power as voters. The National Federation of Women Workers at its biennial conference at Manchester on Aug. 30-31 supported the women bus drivers of London in their demand for equal pay for equal work, a demand that was conceded by the Government; it demanded the passage of a bill to make women eligible to sit in Parliament, which was duly passed; and it formulated a programme of reforms in education and housing for the working classes.

Ireland.—Throughout 1918 the disturbed and rebellious mood of Ireland was a source of constant anxiety to the British Government. The Convention appointed by the Government in June, 1917 (*A. Y. B.*, 1917, p. 98), to prepare a constitution for the future government of Ireland, did not report until April, but the resignation of Sir Edward Carson from the Cabinet in January, with the avowed purpose of devoting himself to the leadership of the Ulster Unionists, was an indication that no scheme was likely to be evolved that would be satisfactory to him and his party of the North of Ireland. Indeed, speaking in County Down on Feb. 6, Sir Edward Carson said that the people of Ulster had not altered in their attitude towards home rule in the slightest degree. He urged that it was the duty of Ulster to stay in the Convention and to consider every proposal with a view to finding a satisfactory solution, but a settlement was not a surrender, and the people of Ulster must maintain their status as citizens of the British Empire.

The majority report of the Irish Convention, as presented to the Prime Minister under date of April 5, was carried in the Convention by a vote of 44 to 29, with all the Ulster representatives voting in the minority. The scheme embodied in the report provided for an Irish Parliament with a Senate of 64 members, including archbishops, lord mayors, representative peers, and representatives of commerce, industry, labor, and local governments; and a House of Commons of 200 members. Forty per cent. of the total membership of the Commons was to be guaranteed to the Unionists, and at first 20 of the 200 members were to be nominated by the Lord Lieutenant to represent the southern Unionists. The House of Commons was to have the right of electing to the British Parliament 42 members who were to have full voting rights on all questions. The bill provided for the establishment of responsible government, the executive power to be vested in the Lord Lieutenant, who would act on the advice of an Irish Executive Committee, responsible to the Irish House of Commons. In regard to the judiciary the provisions of the Home Rule Act of 1914 were adopted and incorporated into the scheme. The limitations and safeguards were much less stringent than in the Home Rule Act. The supreme power of the Parliament of the United Kingdom was to continue undiminished, and the Irish Parliament was not to legislate on the Crown, peace and war, army and navy, treaties and foreign relations, dignities and titles, naval harbors, coinage, copyright, or patent rights. Police and postal services were to pass automatically to Ireland after the war, but the control of customs and excise by the Irish Parliament was postponed for further consideration, to be settled within seven years after the peace. All branches of taxation other than customs and excise were to be under the control of the Irish Parliament. There were also provisions in the scheme for land purchase, civil service, old-age pensions, and national insurance.

Unfortunately for the calm consideration of the report of the Convention, just about the time that it was made public the Military Service bill was introduced into Parliament, and the question of applying conscription to Ireland became the most prominent issue in Ireland. The bill provided that extension of its provisions to Ireland might be made by order-in-council at the pleasure of the King—practically on the decision of the Cabinet. When this clause was under consideration in the House of Commons, there were earnest protests from the Irish Nationalists and from some of the English Labor members. An amendment was proposed that the provision should not go into effect until conscription for Ireland had been approved by the Irish Parliament, and several of the Liberal members, headed by Mr. Asquith, asked that before applying conscription to Ireland a generous measure of home rule should be placed upon the statute book. The amendment was negatived and the Military Service Act became law, although there seemed little possibility of coming to any agreement on the home-rule question.

There were protests from Irish organizations all over the world against any attempt on the part of Great Britain to apply conscription to Ireland, and in Ireland preparations were immediately made to withstand any attempt at conscription. The Irish Parliamentary Party passed a resolution pledging its members to remain in Ireland and oppose conscription, and Joseph Devlin, M.P., who had made a fervent appeal to the House of Commons to give Ireland home rule and to trust her to come to the aid of the Allies of her own free will, speaking at a mass meeting in Belfast, advised the men not to register, not to recognize any military tribunals, not to ask for exemption, nor in any way to acknowledge the unconstitutional machinery of conscription that might be set up in Ireland. The parish priests joined in the crusade and administered pledges to their congregations of passive resistance to any attempt at conscription. The conscription issue brought together, at least temporarily, the Sinn Feiners and the Irish Nationalists, who had been drifting further and further apart. The Sinn Feiners refused to acknowledge the authority of the British Government and announced as their object the complete independence of Ireland. They were in general almost as much opposed to the Nationalists as they were to the British, but at the beginning of May John Dillon appeared on platforms with Mr. de Valera, the leader of the Sinn Feiners, and announced an alliance against the application of conscription to Ireland. Sir Edward Carson, in the meantime, was strongly upholding Irish conscription and deprecating any different treatment of Ireland from the rest of the United Kingdom.

Just at this time there was a change of administration in Ireland. Field Marshal Viscount French became Lord Lieutenant in place of Lord Wimborne, who had resigned, and Edward Shortt became Chief Secretary in place of Mr. Duke, who had been appointed a judge of appeal. It was felt that the appointment of Field Marshal French was a somewhat doubtful experiment, but the need of the restoration of order was so great that all objections were overruled. Almost the first action on the part of the new administration was the issue of a proclamation by Lord French declaring the existence of a pro-German conspiracy in Ireland. On the following day, May 18, more than 150 persons, chiefly of the Sinn Fein organizations, and many of them implicated in the rebellion of 1916, were arrested, and 70 of the prisoners were sent by boat to Holyhead. Among those arrested were Edmund de Valera, the Sinn Fein leader, Count Plunkett, and the Countess Markievicz, who had been imprisoned after the rebellion of 1916 and subsequently released. Immediately after the arrests the Government published a statement of the evidence in their possession of intrigues between Germany and the Sinn Fein movement. The story went back as far as Nov. 6, 1914, and implicated Count von Bernstorff and Captain von Papen, as well as a number of Irish-Americans. It covered the period of the earlier rebellion, and brought up the story to April, 1918, when it was definitely ascertained that a new plot for landing arms in Ireland was ripe for execution. An agent from Germany had actually landed on the coast of Ireland from a submarine on April 12, but the British had captured him and taken his documents. The Nationalist Party was not in any way implicated in the plot.

Meanwhile the movement against conscription was vigorously pushed both by the Sinn Fein and the Nationalists, and much lawlessness prevailed in parts of the country. There were raids on the homes of soldiers back on furlough to get possession of their arms, and strict boycotts were enforced against men who refused to sign the pledge to resist conscription. Not much attempt had been made to carry the report of the Irish Convention into legislation, although in April, in answer to a question in the House of Commons, it was stated by Mr. Shortt that the Government was having a bill drafted on the lines of the majority report. In face of the disturbances in Ireland, however, it was recognized that it would be impossible to proceed with a Home Rule bill; and on June 20, Lord Curzon, for the Government, made a statement in the House of Lords to this effect. At the same time it was definitely stated that conscription had not been abandoned, but that the Irish were to be given an opportunity of showing that they were willing to do without conscription. Some success attended a recruiting campaign instituted by Lord French, but not nearly so much as had been hoped by the Government and the Irish friends of the Allied cause. Nevertheless up to the end of the war, conscription was not put into operation in Ireland, although order was restored in the greater part of the country, and an end was made to illegal drilling and seditious speaking in public.

THE OVERSEAS DOMINIONS[1]

India.—The year 1918 was marked by further progress on the part of Great Britain towards the institution of free responsible government in India. During the winter of 1917-18 E. S. Montagu, Secretary of State for India, spent three months in India, making a careful study of its problems in coöperation with Lord Chelmsford, the Viceroy, a report of which they published on July 6. The first half of the report is devoted to a survey of conditions in India under the existing system of government, the attempts that have been made to associate the people of India in the Government, and especially the work of the Commission of 1917 and the announcement of policy made in August, 1917, when Mr. Montagu became Secretary of State for India (*A. Y. B.*, 1917, p. 99), succeeding Austen Chamberlain. One chapter is devoted to the conditions of the problem. Emphasis is laid on the difficulties of introducing representative institutions or responsible government in a country in which the vast rural population, amounting in British India to 226 millions out of the total population of 244 millions, is almost entirely undeveloped, although its needs and interests are of paramount importance; and where illiteracy still prevails among the vast majority of the men and is almost universal among the women; while the knowledge of English, which is the one great bond of union among the educated, is confined to less than two million people; and the whole country presents innumerable and profound lines of cleavage due to differences of race, religion and social institutions. Note is taken of the outburst of universal loyalty on the outbreak of the war, and the failure of plots engineered abroad to create trouble in India; "but," continues the report,

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[1] Except Canada, covered in a separate article *supra.*

> for the real and lasting effects of the war on India's destiny we should look neither to the generous help of the princes, nor to the loyalty of the people as a whole, nor to the misguided activities of revolutionary gangs, nor yet to the attitude of political leaders. They must be sought deeper, and, we think, in two main directions. First the war has given to India a new sense of self-esteem. She has, in the words of Sir Satyendra Sinha, "a feeling of profound pride that she has not fallen behind other portions of the British Empire, but has stood shoulder to shoulder with them in their hour of sorest trial." She feels that she has been tried and not found wanting, that thereby her status has been raised, and that it is only her due that her higher status should be recognized by Great Britain and the world at large. The war has given a new interest in public affairs to many thousands who were indifferent before. Many men, using language familiar to them in the past, claim that she should receive some boon as a reward for her services, but we do not think that this expresses the general feeling well or justly. We prefer to say that we find a general belief that India has proved herself worthy of further trust and of a more liberal form of government, and that whatever changes are made should be made in recognition of her own progress, rather than as a reward for any services which she has rendered.

The second half of the report is occupied with proposals for changes in regard to the government of India. One of the complaints of the past had been the neglect of India by the British Parliament. To secure continuous instead of spasmodic and limited interest it was proposed to appoint at the beginning of each session a select committee to report to the House of Commons on Indian affairs during the past year. There was no proposal for the present establishment of responsible government for India as a whole. The Government of India was to continue responsible to Parliament at Westminster, and was to be enabled to enforce its will as regards legislation through the Upper Chamber of the Legislature the members of which should be appointed, half official and half non-official. The Lower Chamber should consist of 100 members with a large elected majority, but in cases where the Government insisted on the passage of any measure, and should certify that such legislation in its opinion was essential, the Upper Chamber alone should have the say. It was suggested, however, in the report that this legislature should be regarded as a temporary expedient to be developed later into the ordinary bicameral legislative machinery. It was also recommended that there should be formed a council of princes of the native states to consider and give advice on matters which concerned their territories — a council which in due course might be absorbed into the Upper Chamber of the Legislature.

Much more liberal provisions were recommended for provincial and local government. In regard to the Provinces, there should be responsibility in some subjects, while other subjects should be reserved. No hard and fast lines were recommended as regards the subjects to be reserved. More might have to be reserved in one province than in another, and it might be possible gradually to transfer all reserved subjects until full responsible government should be established. The form of government recommended was an executive council, responsible to the British Parliament, to be in charge of the reserved subjects, with a grand committee to legislate on these subjects without reference to the Legislative Council. The Legislative Council with a large elected majority should be in charge of all subjects not reserved, with two ministers, responsible to it, in executive control. Local government, it was recommended, should be made entirely free from control by any officials not responsible to the electors. Finally, it was recommended that the working of the system, after its establishment, should be reviewed every 10 or 12 years by a tribunal appointed by the House of Commons, with a view to further liberalization of the form of government.

The report, on the whole, was well received both in Great Britain and in India. The extreme Nationalists had proclaimed before its appearance that anything originating with foreigners would violate the principle of self-determination and should therefore be rejected. A vote of thanks for the reform proposals, however, which was moved in the Legislative Council in session at Simla on Sept. 6, received 46 votes in its favor to two votes in opposition.

A committee appointed in December, 1917, to enquire into the nature and extent of criminal conspiracies in India reported in September, 1918. The report contained an elaborate and specific account of German incitements and German plans to import arms from California, overcome the Bengal troops, blow up bridges, take possession of Calcutta, and loot the city. When these plans failed, there were further German plans and conspiracies, none of which had had any real success.

Australia.—The year 1918 opened for Australia in the midst of a ministerial crisis caused by the defeat of Mr. Hughes's second referendum on conscription. (*A. Y. B.*, 1917, p. 101.) The complete figures were not announced until Jan. 10; they were 1,013,000 in favor of conscription to 1,178,000 opposed. It was known before the end of 1917, however, that the measure was defeated, and according to his pledge before the referendum was taken, Mr. Hughes on Jan. 8 handed in his resignation to the Governor-General. It was found impossible, however, to construct a ministry of the Labor Party, whose leader was Frank G. Tudor, and on Jan. 9 it was officially announced that Mr. Hughes was forming a new administration. The new Cabinet formed by Mr. Hughes was almost identical with his former Cabinet. A vote of want of confidence was moved in the House of Representatives by Mr. Tudor, who desired a dissolution and a new election, but it was negatived by a large majority and Mr. Hughes resumed the reins of government.

Mr. Hughes was in England in the summer to attend the Imperial War Conference and the Imperial War Cabinet. While there he elaborated an idea which he had suggested in the United States, through which he had passed on his way to England, of a Monroe doctrine for the Pacific. He stated that all he desired for Australia was security, but that there would be no security with the islands on the northern and eastern shores of Australia in unfriendly hands.

South Africa.—A legal decision of great importance to the future of South Africa was rendered by the Judicial Committee of the Privy Council on July 26, in regard to the claims to unalienated lands in Southern Rhodesia. The lands were claimed by the British Crown, by the British South African Co., by the elected members of the Legislative Council of Southern Rhodesia, and by the natives. The decision was in favor of the Crown, but the British South African Co. was permitted, so long as it remained in control, to sell unalienated lands and to use the proceeds only for the proper expenses of administration and not for the profit of the Company.

Early in 1918 the question of conscription was raised in South Africa. There had been no difficulty in raising troops to oppose the Germans in Africa, but by January, 1918, the troops that had been needed in East Africa were largely released, and the South African Government was prepared to send larger contingents to Europe. It was quickly recognized that it would be impossible to apply conscription generally, and the proposal was put forward that it should be applied only to those of British birth or descent. It was impossible to carry out this proposal, and Parliament adopted the expedient of making a considerable increase to the pay of the soldiers, and of holding out the prospect of preference for returned soldiers in land settlements.

Newfoundland.—There was a change of administration in Newfoundland in January, 1918, and W. F. Lloyd became Prime Minister in the place of Sir Edward Morris, who retired because, while his party had a majority of seven in the Legislature, it had been supported in the last general election by a minority of the voters. At the beginning of the war a coalition Cabinet had been formed with Mr. Lloyd as one of the members. At the close of 1917 there was a danger of the revival of party controversies, and to preserve union during the war, Sir Edward Morris stepped out and recommended the choice of Mr. Lloyd, the former leader of the Opposition, in his place.

CONTINENTAL EUROPE AND ASIA

WILLIS FLETCHER JOHNSON

AUSTRIA-HUNGARY

Austria.—The year in Austria began and continued to the end with strikes, riots and other disturbances, for food, for work, and for peace. Socialist demonstrations increased and various separatist movements early assumed formidable proportions. A general "peace strike" on Jan. 20 involved 100,000 workingmen in Vienna alone and extended throughout the Empire. Because of this the Ministry of Dr. von Seydler wished to resign, but the Emperor would not permit it to do so. Later, on Feb. 8, its resignation was again presented and again refused. Disaffection, agitation, and Parliamentary as well as popular criticisms of the Government so ominously increased that the Emperor on May 4 directed the Premier to adjourn Parliament and to take measures to prevent its reassembling. The Poles and Socialists protested against this course but their protests were ignored. At the same time steps were taken to suppress Czech agitation in Bohemia and elsewhere, the results of which were to provoke still fiercer and more violent agitation and to cause the resignation of the Agricultural, Ruthenian and Slovene Ministers from the Cabinet. The crews of half a dozen warships, being largely Slavs, mutinied, and were with great difficulty restored to order.

Matters grew steadily worse in June. On June 2 the Social Labor Democratic Party demanded the reconvening of Parliament and the taking of steps toward peace. At about this time, too, Bolshevik influences, insidiously imported from Russia, began to manifest themselves. The only response of the Government was to give warning on June 11 of increased severity in repressing all such movements and demands. Five days later there were widespread mutinies among the Slav troops, with wholesale desertions. The Ministry, driven to despair by this result of the Emperor's policy, on June 21 offered its resignation, which the Emperor refused to accept, although on June 24 he did accept the resignation of the Polish Minister, von Twardowski. On June 29 he convoked Parliament to meet on July 16. Criticism of the Cabinet was immediately resumed, with the result that on July 22 the Ministers all resigned and their resignations were accepted. Baron von Hussarek formed a new Ministry by reappointing all the former members excepting the Premier, and it was announced that there would be a general reorganization a little later. Extensive reforms were announced, in promise, on Aug. 16, including revision of the Constitution so as to federalize the empire and to give the Czechs and other non-German peoples autonomy. This bid for their favor was scorned by the Czechs and other Slav peoples, who redoubled their efforts toward independence.

The beginning of the end came on Oct. 5, when the Hussarek Ministry resigned and was succeeded by one under Prof. Heinrich Lammasch, a peace advocate. But this change was futile for checking the process of dissolution which had set in. Mobs and revolutionary rioting were of daily occurrence among the civilians, while mutiny and desertion threatened the army with dissolution. The railroad to Berlin was cut, and demands became widespread for severance of those relations with Germany which had dragged Austria so far toward ruin. By the end of October anarchy prevailed throughout the Empire. The natural climax was, on Nov. 3, the abdication of the Emperor and the flight of most of the Hapsburg Archdukes to Switzerland. A Provisional Government was organized and a Republic was proclaimed. A strong movement was developed for the union of the German provinces with Germany, while the various non-German provinces organized themselves into new and independent states (see *New Central States, infra*). The year closed with Austria as an empire apparently passed out of existence.

Hungary.—Social distress, strikes, and the failure of a war loan drove the Wekerle Cabinet, which had been formed in August, 1917, to resign on Jan. 27. The King asked Dr. Wekerle to reorganize the body, and he did so, creating a ministry which Count Julius Andrassy and most of his followers in the Constitutional Party decided to support. In April a great popular upheaval, characterized by strikes and other demonstrations, occurred in favor of suffrage reform, as a result of which Dr. Wekerle was constrained on May 10 radically to reorganize the Cabinet. He promised to grant some suffrage reforms, including the extension of the franchise to workingmen provided that they could meet the educational qualifications required, namely, to have passed through four classes of the national schools and to be master of the Hungarian language. Woman suffrage was rejected by the Franchise Committee by a vote of 11 to nine.

The programme of the reorganized Ministry did not give popular satisfaction, and on June 22 violent anti-Ministerial and anti-dynastic outbreaks occurred at Budapest, with much loss of life. The Prime Minister gave warning that all further outbreaks would be mercilessly suppressed, but the threat did not restore order. In Parliament, too, there were bitter attacks upon the Government's military policy, which had caused thousands of Hungarians to be sacrificed in Austria's war. Thereafter antagonism toward Austria steadily increased, until on Oct. 17 Parliament adopted a resolution declaring Hungary to be entirely independent, with only the personal factor of the Crown uniting it with Austria. This involved, if made valid, the abrogation of the *Ausgleich* and the abolition of the joint Ministries. A week later Count Karolyi led a vigorous attack upon the Ministry, demanding the resignation of Dr. Wekerle, with the result that on Oct. 25 the latter retired and Count Albert Apponyi became Prime Minister. A last desperate attempt was made to save the dynasty on Oct. 29, when Archduke Joseph of Austria, a second cousin of the King, issued a proclamation setting forth the King's intention to establish Hungarian independence, in accord with the resolution of Oct. 17. But it was too late. The last days of the King himself had come. He was forced to abdicate, and on Nov. 3 the Hungarian Republic was proclaimed by the National Assembly, as Parliament styled itself, with Count Michael Karolyi as Prime Minister and Count Theodore Batthyani as Minister of Foreign Affairs. The Provisional Government suffered from the first much embarrassment from the lack of cohesion among the various political factions, and from the determination of Croatia and other non-Magyar provinces to separate themselves from Hungary (see *New Central States, infra*). In consequence Count Karolyi on Dec. 21 announced his intention of resigning.

The Dual Monarchy.—The affairs of the joint Government naturally shared the vicissitudes of the two members of the Dual Monarchy. To these were added increasing difficulties in foreign relations, the course of which is traced elsewhere (see II, *International Relations*).

FRANCE

The Clemenceau Ministry held its place during the year with power and public confidence unshaken. A concerted attack was made upon it on March 9 by the Socialists, who charged the Prime Minister with being a bourgeois and an enemy of the working classes. Clemenceau met the attack with his usual aggressive spirit, and at the end received a vote of confidence of 400 to 75. Again, on June 4, the conduct of the Government in some details of the war was challenged by the Socialists, and again confidence was voted by 377 to 110. The next conflict was over the renewal of the charter of the Bank of France, giving it the sole right to issue bank notes for a period of 25 years, and in this by adroit manœuvring in a scantily attended session the Socialists came close to defeating the Government. The Government finally won, however, on July 11, by a vote of 327 to 135. Their tactics on this occasion brought upon the Socialists much odium, as they were regarded by the public as ready to embarrass the Government at a critical point in the nation's life, not on a matter of real principle but on one of mere partisan advantage. At the close of their National Congress on July 29, the Socialists adopted resolutions hostile to the allies of France in the war, against the policy of the Government toward Russia, and against the attitude of the American labor delegates who had been visiting France (see also XIV, *Socialism;* and XV, *Labor*). These declarations commanded, however, little attention and less sympathy.

The war and its needs, of course, affected domestic interests in France to a large degree. Early in the year, faced with a heavy deficit, the Government found it necessary to ask a considerable increase in taxation, on incomes, various legal documents, including marriage licenses, sugar, and various beverages. Scarcity of food made it necessary on May 14 to establish a system of meat cards for all customers at the markets. The results were so good that on May 21 the Food Controller announced that the end of the rationing system was in sight. Drastic action was taken against food speculators and against tradesmen charging extortionate prices, and thenceforward the situation steadily improved.

The Minister of Finance on Sept. 25 reported estimated expenditures for 1919 of $1,985,305,000, an increase of nearly $200,000,000 over 1918. He showed that since the beginning of 1915 the Government had raised $23,200,000,000, of which $3,600,000,000 had come from normal sources (taxation, etc.) and $19,600,000,000 from loans; of the loans the French people themselves had provided $14,600,000,000. In October a bill was enacted giving the Government entire control of all French railways during the war and for 12 months following its termination.

In consequence of the armistice of Nov. 11, the French Government took formal possession of the provinces of Alsace and Lorraine, which had been held by Germany since 1871. Metz, the capital of Lorraine, was occupied on Nov. 19, and Strasbourg, the capital of Alsace, on Nov. 24. Prompt arrangements were made to establish French civil government in those provinces, although their restoration to France would not technically be complete until the signing of the definitive treaty of peace. Further progress toward peace was indicated on Nov. 26, when the Ministry of Munitions was transformed into a Ministry of Industrial Reconstruction, Louis Loucheur remaining at its head.

A large measure of official and public attention was given during the year to a number of important espionage and treason cases. The first of these to be taken up was that of Bolo Pasha, a German agent who had conspired to manipulate the French press in the German interest and had extended his intrigues to the United States. He was brought to trial before a military court on Feb. 4, on Feb. 14 was convicted and sentenced, and on April 17 was put to death by a firing squad. In the course of his trial evidence of suspicious relations with the former Prime Minister, Joseph Caillaux, was elicited. M. Caillaux was at that time in prison, having been arrested on Jan. 14 because of revelations of intrigues with German propagandists which were furnished to the French Government by the U. S. State Department. His trial by the Senate for high treason began on Oct. 29, with a prospect of long duration. Another related case was that of Charles Humbert, a Senator of France and proprietor of *Le Journal* of Paris, who was arrested on Feb. 18, on charges of complicity in the intrigues and pro-German propaganda of Bolo Pasha. On Aug. 10 the further charge was made against him of having communicated important intelligence to the enemy, an offense for which the penalty would be death. Application was made to the Senate on Sept. 28 for its permission, which was necessary, to place him on trial on this capital charge.

The trial of Louis J. Malvy, formerly Minister of the Interior, on charges of treasonable intercourse with the enemy, was begun by the Senate sitting as a high court of justice on Jan. 21. He appeared to have been the tool of Caillaux, and it was contended in his defence that he had apparently countenanced treason in the Interior Department in order that he might secure evidence against the guilty persons. The trial lasted until Aug. 6, when judgment was passed upon him by a vote of 101 to 81. He was acquitted of treason, but was found guilty of disregarding, violating and betraying the duties of his office. He was sentenced to five years' banishment, and three days later set out for a home in Spain.

Closely related, also, to the Bolo, Caillaux, Humbert and Malvy cases was the case of M. Duval and his associates on the *Bonnet Rouge*, a Socialist and pro-German paper in Paris. The trial of this case began in April before a court-martial, and ended on May 15 with the conviction of all seven defendants. Duval was found guilty of treason, and was condemned to death, and the sentence was executed on July 17.

GERMANY

Famine, distress, agitation, revolution—these made up the domestic life of Germany in 1918. At the beginning of the year it was recognized that scarce and inferior food was sapping the physical morale of the nation, deaths were more numerous than births, and the reduction of population since the outbreak of the war approximated 7,000,000. In April new taxes were proposed which were expected to produce more than $700,000,000 a year, and these, in the face of a war debt already more than $30,000,000,000, provoked constantly increasing murmurings against the war and demands for peace at almost any price. In June the Reichstag voted a new war credit, swelling the debt to more than $35,000,000,000, or more than two-fifths of the entire wealth of the nation. Before the end of the year the paper currency in circulation aggregated nearly $5,000,000,000, against only $475,000,000 at the beginning of the war.

Nevertheless the Kaiser and the war party persisted in their ways, and gained much encouragement from operations in the field in the early part of the year (see *The European War, infra*). In January the Kaiser dismissed the chief of his Civil Cabinet, von Valentini, who was opposed to extreme measures in warfare, and replaced him with von Berg, who was a Junker of the Junkers. But a still more significant incident occurred at the beginning of June, when a Socialist leader, Frederick Ebert, was elected president of the Main Committee of the Reichstag. This meant, first, that the Socialists would heartily support the Government in its final attempt to win the war, and second, that they would be able to control the Reichstag if ever a direct test were made. A little later, on June 25, the Foreign Secretary, Dr. von Kühlmann, made a startling speech in the Reichstag, in which he practically exculpated Great Britain from responsibility for the war, and admitted that there was no hope of Germany's winning a military victory (see also II, *International Relations*). There was reason to believe that he made this speech by order of the Kaiser, as a "feeler," but when it was received with an outburst of wrath by the war party and the leaders of the Reichstag, he repudiated it in a "furious telegram." The outcome was that on July 9 von Kühlmann resigned his office and was presently replaced by Admiral von Hintze, an extreme Junker and notoriously unscrupulous intriguer in diplomacy. This appointment gave great offense to the liberal parties, but they, and even the Socialists, agreed to support the new Minister and to maintain a favorable majority for the Government in the Reichstag.

Meantime Imperial affairs were much affected by the conflict over franchise reform in Prussia. To this the Kaiser, as King of Prussia, committed himself in 1917 (*A. Y. B.*, 1917, p. 107) and then acquiesced in the refusal to grant it. On May 1 an attempt was made by the Social Democrats in the Prussian Lower House to secure enactment of the desired reform, but it was defeated. The House voted to make voting compulsory on all who had the franchise, but overwhelmingly rejected the "one-man, one-vote" principle. Then the Prussian Premier, who was also the Imperial Chancellor, threatened to dissolve the House if it rejected the reform on third reading. It did reject it, but the Ministry did not resign and the House was not dissolved. The matter came up again on Sept. 5, when the Chancellor declared that the dynasty and the Crown were at stake in the contest over the franchise. By dint of such urging he got the bill through the Upper House on Oct. 2, but it was not passed by the Lower House before the revolution at the end of the war. Incidentally, the Prussian Upper House on July 19 expelled Prince Lichnowsky, formerly Ambassador at London, because of his frank revelations concerning the causes and outbreak of the war (see II, *International Relations*), and on Aug. 17 the Kaiser approved this action.

The next serious conflict within the Government arose in mid-September in the form of disagreement between the Chancellor and Vice-Chancellor over the participation of Socialists in the government. On Sept. 30 the resignations of Chancellor von Hertling, Vice-Chancellor von Payer, and Foreign Secretary von Hintze were tendered to the Kaiser, who accepted them. The new Chancellor, appointed two days later, was Prince Maximilian of Baden, a moderate in politics, who had declared that Germany could not conquer with the sword alone. Dr. W. S. Solf, German Colonial Secretary, was appointed Foreign Secretary of the Empire to succeed von Hintze, and retained also the Colonial Secretaryship; Groeber, a Centrist deputy, and Scheidemann, a Socialist deputy, were appointed Ministers without portfolio; and a little later Matthias Erzberger, a Centrist, was also made a Minister without portfolio, and Bauer, Socialist, was made Secretary of Labor. Frederick von Payer was persuaded to resume the Vice-Chancellorship. With the support of the Centrists and the Socialists, the new Chancellor's position seemed secure, but for only a little time. By mid-October there was widespread agitation for his retirement and the appointment of a commoner as Chancellor. There were also suggestions that the Kaiser himself should abdicate, which were tolerated by the Government. The Federal Council of the Empire on Oct. 16 accepted some amendments of the Imperial Constitution, purporting to give the Reichstag the sole power to declare war and to ratify treaties (see also II, *International Relations*). A Congress of all the German sovereigns was held at Berlin, for the first time since the foundation of the Empire. General Ludendorff resigned what had been practically a military dictatorship on Oct. 27, and the Reichstag was supposed to assume full control of military matters.

By this time the fall of the Hohenzollern dynasty was in general contemplation. The Bavarian Government gave notice on Nov. 2 that in case of the abdication of Kaiser Wilhelm, the Wittelsbach dynasty would claim the reversion to the throne. Public demonstrations were held in many places, demanding abdication and the formation of a Republic. The Kaiser on Nov. 3 addressed a letter to the Chancellor ordering immediate promulgation of the constitutional amendments and declaring that thus the fundamental rights of the Kaiser's person were transferred to the people. But late at night on Nov. 8 or in the early morning of Nov. 9 the end came. The Kaiser abdicated the Imperial throne and on Nov. 10 fled into Holland. At almost the same hour King William II of Württemberg abdicated, and within the next day or two the kings of Bavaria and Saxony were deposed by their Parliaments. Within a week practically all the princes, grand dukes, dukes and other sovereigns of the numerous states either abdicated or were deposed. The Kaiser did not abdicate his throne as King of Prussia, however, until Nov. 28.

Simultaneously with these momentous occurrences there were widespread mutinies on the German fleet and in the German army. Prince Maximilian's tenure of the Chancellorship ended with the Kaiser's abdication, and his last official act was to designate as his successor Frederick Ebert, the Socialist leader. Ebert at once issued an address to the people, appealing for their unanimous support in perfecting the revolution. Field Marshal von Hindenburg placed himself at the command of the new Government, and a Workmen's and Soldiers' Council assumed general direction of affairs. On Nov. 14 a purely Socialist Cabinet was announced, as follows: Prime Minister and Minister of the Interior and of Military Affairs, Frederick Ebert; Foreign Affairs, Hugo Haase; Finance and Colonies, Philip Scheidemann; Demobilization, Transportation, Health, and Justice, William Dittmann; Publicity, Art and Literature, Otto Landsberg; Social Policy, Richard Barth. Two days later, however, a Council of National Plenipotentiaries insisted upon the formation of another and more representative Cabinet, which for a time acted in cooperation with the former. This second body, under the Prime Ministership of Ebert, comprised the following: Foreign Affairs, Dr. W. S. Solf; Finance, Dr. Schiffer; Economics, Dr. August Mueller; Demobilization and Transportation, Dr. Koth; War Food, Emanuel Wurm; Labor, Dr. Bauer; War, General Scheuch; Marine, Admiral Mann; Justice, Dr. Paul Krause; Posts, Dr. Ruedelin. Later Hugo Preuss was made Minister of the Interior, and Matthias Erzberger a Minister without portfolio; and on Dec. 20 Count Brockdorff was appointed Foreign Secretary to succeed Dr. Solf, who had resigned. Haase, Barith and Dittmann resigned their places and were succeeded on Dec. 30 by Noske, Governor of Kiel, Loebe, a Breslau editor, and Wissel, a Reichstag Deputy.

From the beginning the new order of affairs was subject to violent controversies and intestine feuds. Ebert, Haase and their comrades in the first Cabinet of six, styling themselves the People's Commissioners, assumed to exercise supreme authority. But the executive committee of the Soldiers' and Workmen's Council, organizing a Soviet Government after the Russian Bolshevik plan, insisted that the six were merely its agents and were subject to its authority. In addition, Karl Liebknecht, Rosa Luxemburg and other extreme Socialists organized a "Spartacus" party, so named for the gladiator who led a famous servile revolt in ancient Rome, which for a time seemed likely to overawe the capital and gain supreme power through mob evidence. On Nov. 25 an agreement was reached between Ebert's Government and the Soldiers' and Workmen's Council, under which the supreme power of the German Socialist Republic was to be vested in the latter and to be exercised through its Executive Committee. A national conference of deputies from the Soldiers' and Workmen's Councils of all the states was summoned at Berlin on Dec. 16, and it was tentatively agreed to have on Feb. 16, 1919, a general election for delegates to a Constituent Assembly, which should determine the permanent future government of Germany. For the purposes of that election the Empire was to be divided into 38 districts, with from six to 16 deputies each according to population. The territory of the Empire as it existed before the war was to be taken as the basis of division, no recognition being given to the demands of the Poles for the surrender to them of Posen, Dantzig and other Polish districts. Late in December the Poles occupied Dantzig and the adjacent territory, and began arranging for an election for the organization of civil government, whereupon the Provincial Government at Berlin protested and warned the people that all participating in such an election would be subject to the penalties of treason.

Meantime symptoms of disintegration appeared. Late in November the Rhenish Provinces manifested an unmistakable desire to separate themselves from Prussia. The popular cry "Freedom from Berlin!" was raised, and it was planned to organize a new Rhineland state, comprising the Rhenish Provinces and Westphalia, the Rhenish Palatinate, and Hesse—the whole industrial region of western Germany. At the same time Kurt Eisner, the Bavarian Prime Minister and practical head of the Government of that country since the deposition of the royal dynasty, gave notice of a complete breach of relations with Prussia and the Berlin Government, "owing to the efforts of Berlin to deceive the people by withholding the truth about conditions." In this he was almost unanimously supported by Bavarians of all parties. The Liberal party of Baden likewise issued a proclamation demanding a complete separation from Prussia and from the Berlin Government.

ITALY

The war so greatly monopolized Italian activities during 1918 that little was left for more peaceful annals. The Government under the direction of Signor Orlando retained the confidence of Parliament and people and suffered only two changes in its composition. On May 15 General Dallolio and Signor Bianchi resigned the portfolios, respectively, of Munitions and Transportation. The former was succeeded by Giovanni Villa, a Senator, while the duties of the latter were assumed by the Minister of War. There was no political significance in the incident. Leonida Bissolati, Minister of Military Aid and War Pensions, a Socialist, resigned Dec. 28, because of disagreements with the Foreign Minister, Baron Sonnino, concerning war settlements.

The financial condition of the country was excellent. In February and March a war loan of $1,200,000,000 was successfully floated, although it was twice as large as the largest ever previously asked for. Many prominent financiers feared its failure, but the confidence of the Government in the people proved to be justified. It was reported that the national revenues for the year ending June 30 were $179,000,000 more than for the preceding year, despite the loss of receipts from provinces occupied by the enemy. The food situation was also more favorable than in some other countries, owing in part to the enormous utilization of the fisheries.

RUSSIA

It was a year of chaos, approximating anarchy, in Russia, with territorial disintegration, rival governments, civil war, famine, pestilence, and industrial stagnation. The Constituent Assembly, the one legal governmental authority, reassembled at Petrograd on Jan. 18, elected as chairman the Social Revolutionist Tchernoff over a Bolshevik candidate by a vote of 244 to 151, and immediately began seeking negotiations for peace. This defiance of the Bolshevik dictators proved fatal. On Jan. 26 the Workmen's and Soldiers' Deputies, otherwise Messrs. Lenine and Trotzky, issued a decree dissolving the Assembly, which was enforced by the armed forces of the Bolsheviki; and it was announced that it would be replaced by a Congress of Soviets. This assembly first met at Moscow, but afterward removed to Petrograd. About 200 members of the dismissed Constituent Assembly met at Samara in August and attempted to organize a national government, but with no success. Prof. Paul Milyukoff, formerly Minister of Foreign Affairs, also strove to organize the "Monarchist Constitutional Democratic Party" into a "League for the Rebirth of Russia," but met with no success. In October a National Convention was held at Ufa, composed of members of the Constituent Assembly and others, which adopted a detailed scheme of provisional government for all Russia. It contained representatives of all parts of the Empire, and of all political parties except the Bolsheviki, and it created a directorate of five members to exercise supreme power. These were: Nicholas D. Avksentieff, Nicholas L. Astroff, Gen. Vassili G. Boldyreff, Peter G. Vologdski, and Nicholas V. Tchaikovsky.

Meanwhile the Bolshevik Government of Lenine and Trotzky pursued its ruthless way unchecked. By its orders the former Czar, Nicholas Romanoff, was shot to death on July 17, and it was later announced that his wife and children had also been put to death, but the exact fate of the whole family remained shrouded in uncertainty. On Aug. 30 two women of the "intellectual class" attempted to assassinate the Bolshevik Prime Minister, Lenine, but succeeded in merely wounding him. In consequence of this latter occurrence the Bolsheviki began a savage campaign against the "intellectuals," massacring hundreds of them without the formality of arrest and trial. For several weeks a sanguinary reign of terror prevailed at Petrograd, which was finally ended by a proclamation of Lenine's on Sept. 26, after several thousand persons had been killed. But a few weeks later violence was resumed. Hundreds of former officers were shot, and prisoners generally were put to death "to save food." There were threats that on Nov. 10 there would be a general massacre of the entire bourgeoisie and intellectual classes throughout Russia, but this monstrous scheme, if ever contemplated, was not fulfilled.

One of the most hopeful endeavors for the redemption of Russia was made at Archangel under the protection of military and naval forces of the Allies (see also II, *International Relations*). There the "Government of Northern Russia" was formed at mid-August, with Nicholas Tchaikovsky, the famous revolutionist and Socialist, as President and Minister for Foreign Affairs. The political programme of this Government comprised the recreation of Russian democratic power, the reëstablishment of local self-government with universal suffrage, reorganization of the national army and renewal of the war against Germany, and of course repudiation of the treaty of Brest-Litovsk. Fierce attacks were made upon this Government by the Bolsheviki, and for a time it was all but overthrown. But on Oct. 18 it was fully reëstablished, with the following Ministry: President and Minister for Foreign Affairs and for Agriculture, Nicholas Tchaikovsky; War, Interior, and Railroads, Posts and Telegraphs, Colonel Duroff; Finance, Prince Kropotkin; Commerce and Industry and Provisions, Mefodieff; Justice, S. N. Gorodetski; Instruction, P. Guboff.

A still more extensive movement occurred in Siberia. During the month of May General Semenoff, an anti-Bolshevik commander, and Admiral Kolchak, formerly commander of the Black Sea fleet, set up an independent government in Eastern Siberia, beyond Lake Baikal. The two leaders presently quarreled, however, and the movement was in danger of collapse until other factors entered the problem. These factors were the landing of Japanese and other Allies at Vladivostok, and, still more important, the development of a powerful fighting force by some 50,000 Czecho-Slovaks who had been prisoners of war, but who, regaining their liberty, eagerly sought to fight against their former Austrian oppressors, and, arming themselves and living off the country, marched half way across the Asian continent in one of the most daring, romantic and successful military enterprises in the history of the world (see also II, *International Relations*). Occupying Samara early in June, by the middle of the month they were in possession of Ufa, Omsk and Tomsk and 1,250 miles of the Siberian Railroad line. A considerable detachment was also sent clear across the continent to Vladivostok, to coöperate with the Allies and with anti-Bolshevik Russians. In connection with these operations, on July 14 General Horvath, commander of the anti-Bolshevik Russian forces, appointed at Harbin a provisional War Cabinet for Siberia, with himself as Prime Minister and a dozen associates from among recognized leaders of the Russian people. Another Government was formed at Omsk, which on July 26 claimed authority over all Siberia, and for a time there seemed danger of disastrous conflict between it and General Horvath's Government. On Aug. 25 General Horvath declared himself military dictator of all Russian forces in the Far East, in which action he was supported by the troops; on Oct. 2 the Czecho-Slovaks prevented an attempted *coup d'état* at Omsk; and on Oct. 7 it was announced that the Horvath and Omsk Governments had been amicably merged. The Cabinet consisted of the directorate of five already named as having been appointed by the National Convention at Ufa. On Nov. 19, however, a *coup d'état* occurred. Three of the five directors arrested their two colleagues and proclaimed Admiral Kolchak as dictator and commander of the All-Russian army and navy. Against this action General Semenoff at first vigorously protested, but on Dec. 21 it was announced that he had agreed to recognize Admiral Kolchak as Dictator provided that the latter would retire in favor of General Denikine, the Hetman of the Don Cossacks, as soon as a junction of the Cossack and Siberian forces could be effected.

The state councils of the so-called Baltic Provinces of Russia, to wit, Esthonia, Livonia, Courland, and Oesel Island, acting under German incitement, on Nov. 15 decided to form a joint independent state, with an area of 36,634 sq. miles and a population of 2,430,000, of whom more than 40 per cent. were German-speaking. Lithuania, having set itself up with German aid as an independent state, in July sought a German Duke to be its king, whereby it incurred a rebuke and a veto from the German Government. The independence of Ukrainia was challenged by the Bolsheviki, who at the beginning of February captured Odessa, and on Feb. 18 captured Kiev, the Ukrainian capital. In March a German invasion of Ukrainia occurred, which was fiercely resisted by the Bolsheviki and also by the Czecho-Slovaks who had deserted from the Austrian army or who as former prisoners of war had been set at liberty. In the latter half of June a general uprising occurred against the Germans and pro-Germans, in which much of the city of Kiev was burned and the arsenal at Odessa was blown up. A general strike paralyzed the railroad system and prevented the Germans from using the roads for the transportation of supplies. The German power in the Ukraine gradually waned, but the country remained in a disturbed and almost chaotic condition until Nov. 20. At that time a strong anti-German and anti-Bolshevik force of Cossacks, friendly to the All-Russian Government, marched in from Astrakhan, expelled the Ukrainian National Assembly, and established a Provisional Government. This hopeful movement was under the leader of General Denikine, the Hetman of the Don Cossacks.

A National Congress in Turkestan on July 26 declared that country, formerly a province of the Russian Empire, to be a republic in alliance with Russia, with an executive body of 11 members. The republic was to comprise the districts of Semiretchinsk, Syr-Daria, Turgai, Samarkand, Khiva, and Bokhara. (See also II, *International Relations.*)

NEW CENTRAL STATES

While the final disposition of various portions of the former Russian Empire, elsewhere referred to (see *Russia, supra;* and II, *International Relations*), is still in doubt, there appears to be little doubt of the establishment of three independent states of considerable size in Central Europe, extending in a chain from the Baltic to the Adriatic. These are Poland, comprising much of the ancient kingdom of that name; Czecho-Slovakia, comprising Bohemia, Moravia and adjacent territories; and a Jugo-Slav state, comprising Serbia, Bosnia, Croatia, Slavonia, and other provinces.

Czecho-Slovakia.—As early as mid-April the people of Prague and most of Bohemia were in open hostility to Germany and to the Austrian Government, and were making demonstrations in favor of establishing an independent Czecho-Slovak state. In this they were greatly inspired by the news of the marvellous campaign of their countrymen, formerly prisoners of war, in Siberia (see *Russia, supra*). In May the Czech members of the Austrian House of Lords publicly protested against the repressive measures of the Imperial Government, and a few days later, on May 20, popular demonstrations at Prague became so menacing that a state of siege was proclaimed. The Vienna Government on May 22 divided Bohemia into 12 district governments and gave such electoral advantages to the Germans as would, it was thought, greatly reduce the Czech power, both locally and at Vienna. The result was to increase the zeal of the Czechs and Slovaks for independence. At the end of the month Austrian flags were everywhere pulled down and the flag of Bohemian independence was raised. The Austrian Government put to death hundreds and imprisoned thousands in vain attempts to suppress the rising revolution. By the beginning of October a Czecho-Slovak Government was tentatively formed, even to the extent of issuing new currency. The Austrian Emperor as a last resort issued a decree promising a federalized empire under which Bohemia would enjoy local autonomy, but this was disregarded. At the end of October the Czecho-Slovak Republic was proclaimed at Prague, and the representatives of the Austrian Government surrendered their powers and fled. The new Government proceeded in an orderly manner, its first act being to take possession of the railroads and to stop the passage of goods intended for Germany. A national army, for purposes of defense, was organized. On Nov. 10 Prof. T. G. Masaryk, chairman of the Czecho-Slovak National Council, then in the United States on a diplomatic mission, was elected first President of the Czecho-Slovak Republic, the election being made by representatives of all the political parties of Bohemia assembled in Switzerland; on Nov. 15 this election was formally ratified by the National Assembly, and on Dec. 22 he was formally installed at Prague. It was decided to organize the new state into 15 districts, with Prague as the capital. Francis Tomasck was chosen president of the National Assembly, and a Cabinet was formed with Dr. Karl Kramarz as Prime Minister and Voita Benes as Minister of Foreign Affairs. The new state began its existence without well defined boundaries and with a prospect of much controversy with Poland over territorial claims. (See also II, *International Relations.*)

Jugo-Slavia. — While the Czecho-Slovaks were agitating and organizing at Prague, the southern Slavs were similarly busy at Laibach, Agram, and elsewhere in Croatia and Slavonia, seeking separation from Austria and Hungary and union with Serbia. The Prince Archbishop of Carniola was one of the prime movers. In August a great Slav Congress was held at Laibach, comprising representatives not only of the Croatians, Slovenes, Serbs, and other southern Slavs, but also of the Czechs and Poles—all Slavic peoples under Austrian rule. At this it was agreed that the Jugo-Slavs should act simultaneously with the Czechs and Poles for the dismemberment of the Empire and the establishment of independent Slav states. The Austrian Emperor announced that Bosnia, Herzegovina and Croatia would be formed into a single federated state of the Empire, with a large measure of autonomy, but the promise was disregarded. On Nov. 3, simultaneously with the proclamation of Czech independence at Prague, a Jugo-Slav Government was formally proclaimed at Agram and its officers were sworn in the cathedral at that place. The Government was republican in form, and its first President was Joseph Pogaonik, formerly Vice-President of the Lower House of the Austrian Parliament. At the same time the Slovenian National Assembly assumed charge of the government of Carniola, at Laibach. On Dec. 21 it was announced that an agreement had been reached between Serbia and the other Jugo-Slav countries and that a Ministry had been formed representing them all. The Prime Minister was Protitch, formerly Serbian Minister of the Interior; the Vice-Premier was Anthony Koroschetz, a Slovene; the Minister of Foreign Affairs was Dr. A. Trumbitch, of Dalmatia; the Minister of Finance was Nintitch, formerly Serbian Minister of Agriculture; the Minister of the Interior was Svetozar Pribechibich, of Croatia; and the Minister of National Defense was General Raisch, of Serbia. The Government began its career with a serious controversy with Italy over territorial boundaries. (See also II, *International Relations.*)

Poland.—Early in the year a new Cabinet was formed under the leadership of Steckowsky. The country was much distracted and the Government embarrassed by the antagonism between the German and Polish passivist parties on the one side and the Polish Democratic and Ententophil parties on the other. The latter parties, however, through the inexorable logic of events, steadily gained ground. At the beginning of November the Polish authorities occupied Cracow and assumed the government of Galicia, and immediately following the armistice of Nov. 11 they similarly took possession of Upper Silesia, which had been held by Prussia since the Partition. On Nov. 16 they occupied Posen, city and province, and early in December they entered the port of Dantzig, on the Baltic Coast. Thus most of the old area of the Polish kingdom before the Partition was redeemed.

Gen. Joseph Pilsudski, of the Polish Legion, was on Nov. 15 entrusted by the Polish Regency Council with the task of forming a new Ministry. He himself assumed the portfolio of Minister of War; Andreas Moraczewski, a Galician Socialist leader, formerly a member of the

Austrian Parliament, was made Prime Minister; and Leon Yasilewski, a journalist, Minister of Foreign Affairs. The other members comprised representatives of Russian, Austrian and Prussian Poland.

THE BALKAN STATES

Bulgaria.—The Radoslavoff Ministry resigned at the middle of June, and King Ferdinand asked A. Malinoff, a former Prime Minister and leader of the Democratic party, to organize a new one. Malinoff had opposed the breach with Serbia and the alliance with Germany, and his accession was interpreted as a step toward the making of a separate peace. On June 22 a new Cabinet was completed, all but two members of which were members of the Democratic party. This Government was strongly inclined toward peace, and was encouraged in this sentiment by the people, who were suffering much from shortage of food, their own supplies being taken from them for shipment to Germany. The movement was further urged by the rapid advance of the Allied army in Macedonia, and at the end of September the crisis was reached (see *The European War, infra*). On Sept. 28 the Bulgarian Government notified Germany, Austria-Hungary and Turkey of its withdrawal from the war and from alliance with them, and requested the Allies to grant an armistice preliminary to definite peace (see II, *International Relations*). This action was taken after making, on Sept. 23, a vain appeal to Berlin and Vienna for military aid and food. Then, threatened with revolution which might cost him his life, King Ferdinand on Oct. 4 abdicated the throne in favor of his son Boris and fled to Vienna. Boris assumed office as King Boris III, and requested his late allies to withdraw their troops from Bulgarian territory, which they did. He expressed much regard for Great Britain and the other Allies and a desire for friendship with them. Despite the cessation of hostilities, however, popular dissatisfaction with the Government and with the dynasty increased, and on Nov. 2 Boris discreetly abdicated his throne of a month, his Government was dissolved, and a peasants' Government was established under the lead of Stambuliwsky, who for years had been the head of the Agrarian party, and who had organized a peasants' army of 40,000 men.

Greece.—Former Cabinet Ministers fomented revolutionary movements in January, but were arrested and the movements crushed by the vigorous action of M. Venizelos' Government. The chief civil offenders were punished with exile, but two disloyal army officers, who had conspired for restoration of King Constantine, were put to death. Otherwise the domestic affairs of Greece remained tranquil.

Montenegro.—The cessation of the war and withdrawal of the Austrian army of occupation permitted the Montenegrin Government, which had been in exile in France since early in 1916, to return home at the middle of November. There were some insurrectionary movements in opposition to King Nicholas, and the general sentiment of the country favored reunion with Serbia. Indeed, at the beginning of December the National Assembly adopted a resolution deposing the King and declaring for union with Serbia, though its validity was not generally recognized.

Rumania.—The long-existing Ministry of the veteran Bratiano retired at the middle of February, and was succeeded by one under the head of General Averescu. Just a month later, on March 15, the Averescu Ministry resigned, and another was formed by Alexander Marghiloman, with Constantian Arion as Minister of Foreign Affairs. On May 10 Parliament was dissolved and writs were issued for the election of a new one, to meet on June 17. Demobilization of the army was ordered on May 14. At the opening of the new Parliament King Ferdinand declared that peace had been made because further fighting would have exhausted the country to the point of destruction, and he asked for the ratification of the treaty which had been made, which was granted (see II, *International Relations*). On July 12 a motion was made in Parliament for the impeachment of the former Cabinet headed by Bratiano for permitting the unprepared entry of Rumania into the war. This was not adopted, but on Aug. 17 the Chamber of Deputies voted unanimously to prosecute Bratiano and four of his colleagues. Widespread anti-German agitation, led by Queen Marie and her son, Crown Prince Charles, in September led to threats of German intervention and reoccupation of the country, and the Crown Prince on Sept. 21 deemed it prudent to withdraw from the country and go to Odessa. He also married, without the royal consent, the daughter of a Rumanian army officer. For this King Ferdinand ordered him into solitary imprisonment for 75 days; whereupon the Prince renounced the succession. On Nov. 25 Parliament was dissolved and the election of a Constituent Assembly, by universal suffrage, was ordered. On Dec. 17 Bratiano was again called upon to organize a new Cabinet. A mission from the National Assembly of Rumanian Transylvania, which had met at Karlsburg early in the month, was received by the King on Dec. 29, bearing documents containing the Pact of Union of Transylvania with Rumania.

Serbia.—The year's history in Serbia was almost entirely military. With the advance of the Allied forces and the withdrawal of Bulgaria from the war, the civil Government was enabled to return from exile and on Nov. 3 to reoccupy the national capital, Belgrade. In December steps were taken toward a union with the Jugo-Slav states which had been freed from Austro-Hungarian rule (see *supra*).

Turkey.—Sultan Mohammed V died on July 3, and was succeeded by his cousin, a son of the late Abdul Aziz, by name Yussef Izzeddin, who was born in 1857, and who now reigns as Mohammed VI. His accession was proclaimed on July 5. For a time he retained his predecessor's Cabinet, with the infamous Talaat Bey as Grand Vizier and the equally infamous Enver Pasha as Minister of Foreign Affairs. But on Oct. 8 those worthies and their colleagues, having enormously enriched themselves through peculations and the robbery of the oppressed and massacred Armenians, resigned office and fled before the then obviously impending collapse of the Central Powers and ending of the war (see *The European War, infra*). Izzet Pasha, a former Minister of War, became Grand Vizier for a time, but on Oct. 20 a new Cabinet was formed with Tewfik Pasha as Grand Vizier; Refast Pasha as Minister of Foreign Affairs; Havri Effendi, Justice; Said Bey, Public Instruction; Djavid Bey, Finance; Zia Pasha, Public Works; Djelal Mukhtar Bey, Supplies; Rachid Aki Pasha, President of the Council of State; and Houloussi Effendi, Sheikh-ul-Islam. At the end of December the Chamber was dissolved, and a new Liberal Cabinet was formed under the presidency of Prince Sabheddin.

Much scarcity of food and other distress prevailed throughout the year, and when in June a new war loan of $150,000,000 was sought, only $60,000,000 could be obtained. On Dec. 22 it was reported that the Government would confess the bankruptcy of the nation.

SCANDINAVIAN COUNTRIES

Denmark. — Elections for members of the Landsthing, or Upper House of Parliament were held in April, and resulted in a victory for the Opposition parties combined under the lead of the former Prime Minister, Christensen; they secured 45 seats against twenty-seven held by the Radical and Socialist parties which for four years had controlled the Government. The political complexion of the Folkething, or Lower House, remained unchanged and there was therefore no change of Ministry. On May 28 the first Rigsdag, or Parliament, under the new constitution, giving equal rights to men and women, assembled in the new Christiansborg Palace; with women members, nine in number, present for the first time.

Disturbances of industry and commerce by the war caused great increase in the cost of living, accompanied by lack of employment and consequent distress of a most acute character. Factories were closed and lack of fuel for boats reduced the fishery harvest by more than one-half. A winter of famine and disaster was escaped only by the ending of hostilities and the consequent partial restoration of normal trade conditions.

Norway. — Economic distress prevailed in Norway during a large part of the year. The people were placed on food rations as strict as those of any of the belligerent nations, while labor suffered from lack of employment. Early in the year semi-official warnings were issued to the people that the country was by no means free from danger of being involved in the war. The situation, however, was ameliorated by the conclusion of an agreement with the United States under which supplies of the necessities of life were received from this country (see II, *International Relations*).

Sweden. — In Sweden conditions were if possible worse than in either of her Scandinavian neighbors. The Minister of Agriculture early in March declared the outlook for food and fodder to be disquieting, with supplies in sight for only two months, and the people were placed upon stricter rations. At the beginning of May the Minister of Finance declared that the nation was "literally fighting against starvation." The shortage of coal was another cause of distress, resulting in the stoppage of many industries. Unfavorable weather also caused a shortage of crops. Relief was measurably obtained by the conclusion of an agreement with the United States, under which necessary supplies were obtained from this country (see II, *International Relations*). This agreement led, however, to the resignation of the Minister of Industrial Supplies, who was unwilling to assume responsibility for the new conditions.

OTHER EUROPEAN COUNTRIES

Belgium.—The year began with Germany still in possession of nearly all of Belgium, and still oppressing and plundering that country with unrestrained savagery. The Belgian Government in January issued a detailed statement of the manner in which Germany had stolen trade secrets, removed machinery to German factories, and in general destroyed the industries of the land. But German oppression went too far and goaded the Belgians to revolt. In February an attempt was made by German agents to divide Belgium asunder, setting the Flemings against the Walloons, by compelling some of the Flemings to proclaim their independence of King Albert's Government and the separation of Flanders from the rest of Belgium. Belgian judges at once ordered the arrest of these traitors, whereupon the German authorities seized three judges of the Court of Cassation and transported them to Germany. At this all the other judges of that court resigned, all magistrates throughout Belgium refused to serve further until the three judges were restored to their places, and a wave of resentment and resistance to German tyranny swept over the country, obliterating all the old animosity between Flemings and Walloons and uniting the nation as it had not been united before for many generations. A formal protest was also sent to the German Government by all the Belgian senators and deputies in the occupied part of Belgium. The German Government persisted in its tyranny, whereupon at the middle of May more than one million Belgian workingmen went on strike, refusing to work for Germans, even when threatened with starvation and imprisonment.

This strained state of affairs continued throughout the summer and early fall, but the redemption of the country came with the armistice in November. Some slight disorders occurred and a number of German officers were killed by excited mobs in Brussels, but in general the Belgians exercised marvellous self-restraint in their hour of exultation. King Albert reëntered Ghent on Nov. 13 and Antwerp on Nov. 19. He reëntered his capital, Brussels, on Nov. 22, amid a magnificent popular and military demonstration, in which American troops prominently participated. On that day he met his Parliament and made a speech from the throne, in which he announced that equal and universal male suffrage would be at once granted; that Belgium would insist upon being an independent and not a neutralized and protected state; and that there would be a reciprocal respect for the rights of Flemings and Walloons which would assure the perfect union of the nation. A new Ministry was formed, containing six Catholics, three Liberals, and three Socialists, including the Socialist leader, Edward Anseele. Baron de Broqueville was made Prime Minister and Minister of the Interior; M. P. Hymans, Minister of Foreign Affairs; General Janson, Minister of War; and Emile Vandervelde, Minister of Justice. Representatives of the Labor party voted almost unanimously to approve the entry of Socialists into the Cabinet.

Finland.—The year began with Finland in the throes of civil war between the Red Guards, backed by Socialists and Russians, and the White Guards, backed by Germans. The government, depending upon the White Guards, appealed to Sweden for aid, which was not granted. At the end of January the Government was driven from Helsingfors and a Provisional Social Democratic government was set up there. The former Prime Minister, Judge Svinhufvud, fled to Germany. By German troops and warships (see II, *International Relations*), however, the Government was restored, and Judge Svinhufvud was on May 2 named by the Parliament as Dictator. The old Cabinet resigned on May 25, and a new one was formed with Paaskivi, a member of the Old Finnish party, as Prime Minister, and Colonel Vostesleff as Minister of War. The supposed German sympathies of the latter moved General Mannerheim to resign the chief command of the Finnish army. The Government devoted much attention thereafter to the establishment of a monarchy under a German prince, but it was not practically consummated (see also II, *International Relations*). On Dec. 13 a peaceful revolution was effected, the Landtag accepting the resignation of Svinhufvud and electing General Mannerheim as Prime Minister in place of Paaskivi.

Holland. — The war's interference with industry and commerce and the resulting unemployment, famine and distress caused serious disturbances in Holland, including on Feb. 4 a universal strike for 24 hours as a protest against the policy of the Government. In April the Government introduced a bill providing for compulsory civilian labor whenever required by the "extraordinary circumstances" then existing. The popular response was seen in great public demonstrations demanding "Bread and Posthuma's head," Posthuma being the Minister of Agriculture who was suspected of being in German pay and sacrificing Dutch for German interests. Indeed, all the Ministers except Trueb, the Minister of Finance, were suspected of German sympathies. A general election was held on July 3, for the first time under the new law which provided for "one man one vote," substituted proportional representation for plural voting, and increased the electorate by about 500,000. The result was a victory for the Conservative parties, and the extra-Parliamentary Ministry at once resigned after holding office since 1913. Much difficulty was experienced by the Queen in forming a new Government, man after man declining to undertake the task. At last, on Aug. 30, Jonkheer Ruiys de Beerenbrouck, governor of the Province of Limburg, accepted the commission and organized a Conservative Cabinet, with Jonkheer van Karnebeek, reported to be pro-German, as Minister of Foreign Affairs and Mynheer van Ysselsteyn as Minister of Agriculture in place of the detested Posthuma. The Queen opened the States-General in person on Sept. 18, and in her address deplored the distressful condition of the country. The very next day serious rioting occurred in many places, though the Queen herself was invariably treated with respect. At the middle of November, after the armistice, the Government announced an increase of food supplies, but grave disturbances continued, and the Socialist leader in Parliament, Peter J. Troelstra, criticised the Queen and her entourage, and incited revolution. A few days later, however, all such demonstrations ceased and order was everywhere restored. (See also II, *International Relations.*)

Luxemburg.—The Grand Duchy of Luxemburg elected a new Parliament, which met on Sept. 14, the chief issue in the election being that of a new Constitution, substituting universal suffrage for a property and tax qualified suffrage, and investing Parliament with treaty-ratifying power. On Nov. 18 a resolution was adopted calling for a plebiscite to determine the future form of government of the country, but a motion, supported by Liberals and Socialists, demanding the abdication of the Grand Duchess was rejected. As a result of the armistice, on Nov. 20 the Germans evacuated Luxemburg and the next day the American Army of occupation marched in and was welcomed with great popular and official rejoicings.

Portugal.—A mutinous outbreak occurred on Jan. 3 on a battleship in the harbor of Lisbon, which was believed to be part of a revolutionary movement, but which was suppressed by artillery fire from the forts. The Cabinet on Feb. 21 decided to call for a general election, to choose a President of the Republic and also senators and deputies specially empowered to revise the Constitution. On March 29 it further announced the release of all political prisoners, the restoration of all suspended newspapers, and the reopening of all political clubs. Following this, on April 28, the election was held, and Dr. Sidonio Paes was elected President by direct universal suffrage. He had long been prominent in Portuguese politics, and had led the revolution which in December, 1917, overthrew the Government of President Costa (*A. Y. B.*, 1917, p. 116), since which time he had served as Provisional President. He was proclaimed President on May 9, and a new Ministry was then organized. In his message at the opening of Parliament on July 24, President Paes promised a more active participation in the war. Revolutionary movements necessitated proclamation of a state of siege on Oct. 14, and on Dec. 14 the troubles culminated in the assassination of President Paes by a man who was instantly seized and killed by the populace. Admiral Canto y Castro was chosen on Dec. 17 to succeed him as President, and on Dec. 24 the Ministry was reorganized with Tamajnini Barbosa as Prime Minister and Minister of the Interior.

Spain.—The Government unearthed an extensive revolutionary plot at the very beginning of the year and adopted strenuous measures for its suppression, dissolving Parliament, dismissing a number of minor army officers, and suspending telegraphic and telephonic services. In the course of a fortnight normal conditions were restored, and preparations were made for the general elections on Feb. 24. Everywhere pro-German candidates were badly defeated. The Democratic Liberals won 93 seats, the Conservatives 86, the Romanones Liberals 35, and the Republicans 33. As a result, the Cabinet of the Marquis de Alhucemas resigned on Feb. 28. The Marquis was asked to form another and did so, with himself as Prime Minister and Minister of Foreign Affairs, but on March 9 he again resigned and declined to serve further. The King called into conference the heads of the five chief political parties, but failing to obtain satisfaction from any of them, persuaded the Alhucemas Ministry on March 10 to resume office unchanged. Two days later Señor Jimeno, Minister of Marine, a Romanones Liberal, resigned, and a few days later it was announced that the King had accepted the resignation of the whole Cabinet. The King then turned to Antonio Maura, a Conservative and a former Prime Minister, who formed a Cabinet with Señor Dato, a former Prime Minister, Minister of Foreign Affairs; Count Romanones, Minister of Justice; General Marina, Minister of War; and the Marquis de Alhucemas, Minister of the Interior. This coalition Cabinet was received with universal favor, and the strikes and other disorders which had prevailed throughout the country were at once abandoned.

It was well that political harmony was thus restored, for the country was about to suffer the grievous affliction of a contagious and deadly disease, which originated in Germany and was brought thence to Spain, whence it spread to the rest of the world under the name of Spanish influenza. It proved a disastrous scourge, claiming tens of thousands of victims. German political intrigues also became troublesome, so that on July 7 the Government was compelled to pass a stringent Espionage Act. This measure gave umbrage to some Republican deputies, who withdrew from the Chamber and declared that they would have no further Parliamentary relations with the Government. The Cabinet resigned on Oct. 8, but was at once reorganized by Señor Maura, and continued in office until the middle of November. Then a second reorganization was effected, as a result of which Count Romanones became Prime Minister and also Minister of Foreign Affairs. The Cabinet again resigned on Dec. 3, but was persuaded to remain in office for a time, pending reorganization.

ASIA

China.—President Feng Kuo-chang performed an act which was characteristically Chinese and which would have been possible in no other land. This was the issuance of a public proclamation to the effect that the country was in a sad condition, that there had been defections of various military officers and resignations of Ministers, and that he himself, as President, was primarily at fault. He dared not, he said, hold his position in opposition to public censure, yet he was under constitutional restraint not to abandon it. Therefore he would strive earnestly to restore order and relieve the people of their woes, and then retire from an office which he was not fit to fill. After this extraordinary pronouncement he devoted himself to his duties with an access of zeal. At the beginning of April he recalled Tuan Chi-jui to the Premiership, adopted a more vigorous policy against German propagandists, and also against rebellious movements in various provinces. At the beginning of June the leaders of the insurrections in the northern provinces expressed a desire for peace, and hostilities practically ceased, but a month later a serious revolt occurred in Thibet. At the middle of July, at the request of Japan, the ports of Kal-gan, Kweisua, Tao-nan, Hulu-tao, Tol-un, and Chi-fu-no were opened to commerce. At the same time the unprecedented step was taken of sending a Minister to the Vatican.

Parliamentary elections were concluded, excepting in five rebellious provinces, by mid-July, and showed a majority for the An-fu or Military party, and the new Parliament was formally opened by the President on Aug. 11. At the beginning of September the Presidential election occurred, and Hsu Shih-chang was elected by a large majority. He was installed as President on Oct. 15, and shortly afterward issued a decree ordering cessation of hostilities between the northern and southern provinces. He insisted that civil strife must stop, and that the Republic must devote itself to industrial progress and social reform. (See also II, *International Relations.*)

Japan.—Scarcity of food, especially rice, caused serious disturbances, with rioting, arson and something much like actual insurrection. In an endeavor to remedy the trouble the Government on Aug. 17 issued a decree ordering that all stocks of rice be requisitioned and placed upon the market at reasonable prices. It also requested the Chinese Government to remove its embargo upon exports of rice, which was done. This action somewhat ameliorated conditions, but it had been delayed too long to avert grave disorders, followed by industrial strikes and revolutionary propaganda. At mid-September Marquis Okuma warned the Emperor that conditions created or aggravated by the war had widened the gulf between rich and poor and had provoked in the latter class an ominous degree of discontent which, if not allayed, threatened to undermine the foundations of social order and the integrity of the Empire. He urged that fuller recognition be given to the inevitably rising power of the working classes, who were no longer negligible, and recommended that Marquis Saionji be invited to form a Cabinet, in succession to that of Baron Terauchi, and also that Viscount Kato be included in the Cabinet as Minister of Foreign Affairs.

The first step toward a change of Government had occurred on April 24, when Viscount Motono resigned the Foreign portfolio in the Terauchi Cabinet, and was succeeded by Baron Goto. This change had no political significance. But the rice riots and revolutionary menace finally moved the Ministry of Count Terauchi, which had been in office since October, 1916, to resign on Sept. 21. Following the advice of Marquis Okuma, the Emperor summoned Marquis Saionji to form a new Ministry, but that far-seeing statesman declined, and recommended instead that the work be entrusted to Takashi Hara. The Emperor acted upon this counsel, and on September the Hara Cabinet was installed. This event marked an epoch in the history of Japan. Hara was the first commoner to be Prime Minister. Also, he was the leader of the Seiyuki or majority political party. His appointment meant, therefore, that the headship of the Ministry was no longer to be reserved for a member of the peerage, and also that the Cabinet was thereafter to be in accord with the political majority in Parliament. Hara assumed the portfolio of Justice as well as that of Prime Minister, and assigned the others as follows: Foreign Affairs, Viscount Yasuya Uchida; Interior, Takejiro Tokonami; Finance, Baron Korekiyo Takashi; Agriculture and Commerce, Tatsuo Yamamoto; Public Instruction, Tokogoro Nakahashi; Communications, Utaro Noda; War, Gen. Gilchi Tanaka; and Marine and Navy, Adm. Tomosaburo Kato, a reappointment. The formation of this non-bureaucratic Cabinet, the first in Japanese history, was received with great popular satisfaction. On Dec. 18 the Minister of the Interior announced that the Government would bring in a bill for a great extension of the present limited suffrage, and for a fuller measure of constitutional government.

Armenia.—The Allied policy of self-determination for peoples and for the emancipation of non-Turkish peoples from Ottoman rule apparently assures the erection of what is left of the Armenians into an independent or at any rate an autonomous nation. That devoted and martyred people suffered much during the early part of the year from Turkish savagery, directed from Berlin. In February the entire male population of Samsun, a city of 13,000 people, on the Black Sea, was massacred. In May the Armenians in the Caucasus took heart of courage and organized for self-defence, proclaimed their independence, and said, "If we are to perish, let us perish with honor." Making their capital at Tiflis, they organized an army which effectively held its ground against the Turks. A Provisional Government was formed, with C. R. Katchaznuni as Prime Minister and A. Shatissian as Minister of Foreign Affairs.

THE EUROPEAN WAR[1]

Ralph Dickinson

Victory.—After almost four years of warfare, the Allies in mid-July took the offensive. Military operations ended at 11 a. m. on Nov. 11, in the 52d month of the war, in accordance with an armistice signed in the Compiègne Forest, by the terms of which the Allied armies were left undisputed victors in full possession of the field.

The story of the year's events leading to the armistice naturally falls into two parts, one concerned with the German offensives from March 21 to July 18, and the other with the Allied offensive under Marshal Ferdinand Foch, "successful wielder of the most intricate and colossal military machine of which we have any knowledge." As a part of Marshal Foch's offensive on the Western Front there were fought in Macedonia and Serbia, in Palestine, and in Italy campaigns that shattered the lesser partners of Germany, who one by one accepted such terms as the Allies offered. These defections, the growing misery and unrest behind the lines in Germany, shortage of supplies and men, and the ceaseless and victorious military pressure by the forces of the Allies all along the Western Front finally brought the once powerful Imperial German Government to its knees.

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[1] A complete chronology of the war is given in Department XXXI. General Pershing's report on the operations of the American Expeditionary Force is extensively quoted in Department XI.

Relative Strengths of the Opposing Forces.—The collapse of Russia on the Eastern Front released more than a million men and enormous amounts of artillery, available for transfer to the Western Front. This accession brought the German army there from 150 divisions in November, 1917, to 196 by March, 1918, when the approximate strengths of the opposing forces were: Germany, 4,100,000; Allies, 3,850,000. This last total was made up about as follows: American, 100,000; Belgian, 150,000; British, 1,600,000; French, 2,000,000. But Germany still had available for transfer from the Eastern Front 13 divisions, in addition to the normal drafts to keep her ranks full. In addition she had the great advantages of unified command, interior lines, and a homogeneous force to face four distinct armies commanded by what was virtually a committee of the Allied War Council. Committees have always made notoriously poor commanders. While the Allied armies were on the offensive their coöperation had given fair results. Facing the long and boldly announced German offensive, the tendency of each commander to consider his own front regardless of conditions elsewhere was full of danger. In fact, but for the prompt action of Fayolle, Debeney and Humbert, under Foch, in Picardy, this independence might have proved fatal.

Ludendorff's Gamble.—At the beginning of the year, unrest in Germany, the Allied determination to carry the war through, the growing number and quality of the American troops in Europe, all pointed to one conclusion: unless Germany won in 1918 her opportunity was gone forever. Methods of attack developed on the Eastern Front by General von Hutier were believed to offer prospects of a clean "break through" of the Allied lines as they had the Russian, restoration of the "war of movement," and a favorable military decision by the destruction of one or more of the Allied armies. A grand offensive was loudly proclaimed both for home and foreign propaganda. If it succeeded, Germany won the war. If it failed, her armies could, the Germans believed, fall back behind their trench systems and hold out until the world, sick of the struggle, consented to make terms. Ludendorff persuaded the German Government to let him make the gamble. Once committed to the plan, led on by the gains made to see success just ahead, not daring to give up and admit failure after such enormous sacrifices or while any chance of final success remained, Ludendorff attempted five offensives between March 21 and July 18. Then, the best of his picked troops gone, the Allies at last approaching a numerical equality, the strategy of Foch placed and kept him on the defensive. Having failed, Ludendorff tried to hold on too long before taking up his positions for the defensive warfare that was to wear out the Allies.

Ludendorff began his offensive in Picardy on March 21, directing it at the junction of the British and French fronts, attempting to separate them and drive through to the Channel, rolling back and destroying the British armies or penning them in the area north of the Somme while he dealt with the French. The von Hutier method of attack succeeded in breaking through on a front of almost 40 miles, shattering Gough's Fifth British Army, and the Germans advanced between the Oise and the Somme, almost reaching Amiens, commanding the principal railway lines connecting the British and French and the railroads from Havre to the British front. Here they were held with the coöperation of Debeney's and Humbert's French armies extending westward along the Oise and thence northward along the Avre and Ancre, to the aid of the British.

Ludendorff delivered his second heavy blow in Flanders on April 9, in an effort to cut in two the British front at Armentières and do to a part what he had not been able to do to the whole in Picardy. After considerable gains this blow also was halted.

Bringing up more divisions from the Eastern Front, and after a delay for preparation during which the Allies had rushed troops from every front where they could be spared and had greatly expedited the arrival of American divisions, not yet fully trained, Ludendorff struck again on

May 26. This blow, across the Aisne from the Ailette north of Soissons to the Aisne north of Rheims, was an attempt to capture Paris. The Germans advanced on a 30-mile front, quickly overran the French positions, and advanced once more to the Marne from Dormans to Château-Thierry, taking Soissons and positions to the west. Checked at Bouresches and Château-Thierry by American infantry and marines, this operation, like the others, was halted after prolonged fighting.

Between Rheims and Soissons there was not room for Ludendorff to bring the full weight of his numerical superiority to bear. Accordingly he struck on June 9 from Noyon to Montdidier, southward toward Compiègne. Here gains such as he had made in his previous offensives would wipe out the French salient west of Soissons in the high ground between the Oise and the Aisne, force the French into the level and open country, and open the roads to Paris from the north as the May offensive had opened the northeastern. But now, for the first time, his initial success was small. After the thrust at Amiens the French reserves had been moved near the junction of the French and British lines, and were accordingly close at hand. Also, the element of surprise, so prominent a feature of the von Hutier attack and so decisive in the three previous blows, seemed lacking. The German attacks made very small gains but suffered enormous losses and their effort soon ceased. The attempts on Paris had been halted along a line of natural obstacles in and around the Forest of Villers-Cotterêts on the Soissons-Château-Thierry line, the high ground in the Oise-Aisne angle, and the Forest of Compiègne. Unless he was willing to give up his campaign Ludendorff had to strike again.

To obtain the wide front for attack necessary for success required the wiping out of either the Compiègne or the Rheims salient. Ludendorff had failed to remove the Compiègne obstacle, while that at Rheims constituted a threat against his newly won positions between the Aisne and the Marne. Ludendorff struck at Rheims to wipe out that threat and gain the room needed in his operations against Paris. But again it was necessary for him to delay while he prepared his blow. When it fell, July 15, along the Rheims front, the German numerical superiority had been further reduced by the arrival along the front of some 500,000 American combatant troops. Numerically, however, Ludendorff was still superior. The French were prepared and awaiting attack. The German losses were enormous, their gains relatively small; in fact, along most of the front the attack had failed. However, on July 16 and 17 they had advanced beyond the Marne east of Dormans and were approaching Epernay, while they had closed in somewhat on Rheims.

It was a situation, in the words of Marshal Foch, "from which we had everything to fear. It was at this moment that great action became necessary. We decided first of all to bar the way to Paris and Amiens." It was possible to strike a counter blow from either the direction of Epernay or Compiègne. But while the Germans held a numerical superiority and were on the offensive, it had been necessary to hold the Allied reserves so as to cover the threatened points. They were accordingly held in the region around Montdidier and Compiègné, and the counter-offensive could be best delivered from the Soissons-Château-Thierry front near Compiègne.

Foch's Counter-Offensive.—On July 18 Marshal Foch commenced his counter-offensive, smashing Ludendorff's Marne salient and forcing a withdrawal. Having thus successfully "barred the way to Paris," he next "barred the way to Amiens" by wiping out in a series of attacks the salient driven in Picardy by the March offensive. It was necessary, so to speak, for Marshal Foch to "get elbow room" for his coming operations, now that accessions of American troops were rapidly restoring the Allies to numerical parity, with superiority of numbers assured. The Allied offensive had begun.

Having cleared the Marne salient by the counter-offensive of July 18 and the Amiens salient by the "Third Battle of the Somme" on Aug. 8, Marshal Foch was able to plan his offensive with little regard to what the Germans might attempt. As he states the problem: "Firstly, we cleared out the communications east and north, and then attacked on a front of 400 kilometres." The problem was rather one of holding the Germans on their over-extended front, making them fight and destroying their armies, than merely forcing them to retire from French and Belgian soil.

Attacked from Arras to Rheims, the Germans suffered severe losses, being forced back to the Hindenburg Line and at places beyond it. To aid the center, reserves were brought in from the flanks, while Austrian troops appeared on the Western Front. Both of the German flanks were vital spots. An advance at the north threatened the submarine bases and lines of supply, while at the other extremity an advance down the Meuse would cut the essential Metz-Sedan-Mézières-Lille supply line. If the attack doubled either flank back on the center, disaster would follow.

Under Marshal Foch's plan the Americans attacked on Sept. 12 and wiped out the St. Mihiel salient to get room and prevent attacks against their flanks in subsequent operations. It made possible an advance against Metz or down the Meuse. Ludendorff did not have to wait long to find which it was to be. On Sept. 26 the American First Army, withdrawn from the St. Mihiel salient, attacked between the Meuse and the Argonne, and in conjunction with Gouraud's Fourth French Army advanced rapidly down the Meuse toward Sedan and the Metz-Lille railway. Calling on his fast dwindling reserves, Ludendorff succeeded in slowing up this advance only to be struck on the other flank in Flanders by the Belgians, with General Plumer's Second British Army, Degoutte's French, and American divisions. Again by throwing in reserves, this attack was momentarily halted. But while thus in distress on his flanks, Foch gave Ludendorff no rest in the center, and any hope of holding the Hindenburg Line through the winter vanished when the attacks here broke through from north of Cambrai to the Oise east of St. Quentin, which was taken by the French on Oct. 1 while a British and American force took Cambrai on Oct. 9.

To the east French, Italian and American troops from the Oise to the Meuse drove ahead in a series of well timed and thoroughly coördinated attacks. Having forced Ludendorff to expend his reserves lavishly, and then having broken through, the pressure was kept up so unceasingly along the entire front that the Allied advance could not be stopped. After the fall of Cambrai the Germans, seeing that their reserves were gone and that they could not stem the growing Allied flood, began another "peace offensive" and suggested an armistice. The Allied gains all along the front kept up until, again to quote Marshal Foch, "the armistice came to interrupt our offensive, which would have ended in disastrous results to the enemy."

Reduced at the date of the armistice to about 2,750,000 men, deserted by her former allies, the German Army in the light of subsequent disclosures was reduced to a state where it could have extricated itself in no way other than the one taken, the prompt acceptance of armistice terms dictated by the Allies and amounting to an unconditional surrender (see II, *International Relations*).

The Final Battle Line.—At the hour the armistice ended operations, the line ran as follows: from the boundary of Holland through Ghent to the Lys and Scheldt, held by the Belgians together with French and American divisions; from the Scheldt to the Sambre, through Eecke, Grammont, Ath and Mons to Thunn, by the British; from the Sambre to the Meuse at Sedan, through Thunn, Rocroi, and Mézières, by the French, with Italian divisions in the line around Rocroi; from the Meuse to the Seille, through Bazailles, Stenay, Jametz, Manheulles, Fresnes, to Port-sur-Seille by the First and Second American Armies; and from Port-sur-Seille to the Swiss border by the French.

Tactical Developments.—The year saw a modification of the trench warfare, or war of position, tending toward warfare of movement. The Germans hoped to secure a decisive advantage from this change, as the result of methods suggested by General von Hutier and successfully used on the Russian front to give a clean break-through of the opposing lines so that movement might be possible. A principal feature of the von Hutier method is the secrecy with which the movement is prepared and delivered, reserves and troops for the assault being brought up under cover or by night marches. An extremely heavy concentration of artillery fire is provided, the bombardment being short but very severe, and more trench mortars and machine guns are used than ever before. Many gas shells are used, but are fired into the areas in rear, breaking up communications and reserves and confusing the defense. Finally, an attack by masses of infantry, following very closely the rain of artillery projectiles, sweeps over the position being attacked, followed by wave on wave of fresh troops thrown constantly against the exhausted foe. The Germans also made use of a method of "filtering through" with small forces which then opened fire from the flanks or rear with machine guns or rifles.

Given the element of surprise and other conditions being favorable, as in the March and May offensives, the method proved effective. With greater experience, using the "elastic defense" of considerable depth, with reserves not too far distant, the French were able to bring the new style of attack to a halt before it could break through, as they demonstrated in June north of Compiègne and in July east of Rheims. The Allies also, utilizing the experience gained in General Byng's attack before Cambrai in 1917, developed a system in which surprise and the use of a large number of small, fast tanks played a principal part. This attack proved especially effective against the German defensive use of machine gun groups, in which they placed great reliance.

The breaking through of positions was in each instance followed by considerable gains, a partial return to the war of movement of the warfare previous to the autumn and winter of 1914. But always this movement was suspended by a return, more or less definite, to position warfare. Especially was this true when the time between offensives was considerable because of the elaborate preparation necessary, as in the case of the huge German attempts.

With the taking of the offensive by Marshal Foch there followed a period of coördinated offensives on rather narrow fronts, each helping the ones on its right and left, constantly shoving the enemy, affording small opportunity for successful counterattack or preparation to meet the next thrust. In fact, such war of movement as was restored was more skillfully handled by the Allied commanders than by the self-styled masters of the "war of movement." The advance of British, French and American troops on the Albert-Montdidier front from Aug. 8 to 10 of some 14 miles on a 45-mile front, capturing 50,000 prisoners and over 800 cannon, and the advance of the American First Army down the Meuse on Sedan are two instances, at least, where the German masters of the "war of movement" practiced it under Allied promptings.

Aerial Activities.—The use of airplanes for bringing machine gun fire and bombs to bear on troop formations increased markedly during the year. Both sides continued bombing raids on important cities and industrial centers. During the year 396 bombs were dropped on Paris, causing 1,211 casualties. On Aug. 6 airplanes and Zeppelins dropped 228 bombs, killing two and wounding 392. German raids on London were not so frequent nor so successful as in former years. As Allied superiority in the air increased and their raids became correspondingly more destructive and far-reaching, the German population of the Rhine towns suddenly became aware that the practice was brutal and should be abolished, and their Government proposed that raids on non-military objectives should be stopped.

Night-bombing raids of billets and rest areas back of the lines became an increasingly common means of adding to the terrors and discomforts of modern warfare. London announced that in the 13 months preceding the armistice British fliers carried out 709 bombing raids over German territory, dropping 737 tons of bombs.

Losses and Cost of the War.—The number of men killed in the war will approach 7,000,000. Incomplete reports and estimates give the losses as follows: Great Britain, 658,704; Germany, 2,000,000; Austria-Hungary, 1,000,000; Russia, 2,000,000; France, 1,400,000; Belgium, 175,000; Italy, 350,000; Balkan States and Turkey, 250,000; United States, 40,500. The total of killed and wounded will run between 25,000,000 and 30,000,000, while the total deaths caused by the war will reach 14,000,000 (see also XI, *The Army*).

The direct cost of the war is estimated to be $200,000,000,000 up to the end of the year 1918, $132,000,000,000 being for actual expenditures for military and naval purposes, the remainder being interest and other indirect expenses due to the war.

THE WESTERN FRONT

The First German Offensive, in Picardy.—After the spirited German reactions before Cambrai toward the end of 1917, both sides settled down to a round of artillery actions, local attacks, and trench raids, the Germans in preparation of their much-heralded offensive, the Allies preparing to meet it and trying to gain information.

On March 21, attempting to break the Allied line at the junction of the French and British fronts, the Germans attacked the 50-mile front from Arras to La Fère after a short but exceedingly severe bombardment. Bringing up 40 divisions by night marches, and aided by an unprecedented artillery concentration and foggy weather, they struck General Gough's Fifth British Army of 14 divisions. Gough apparently was too confident of the ability of the line to hold any attack, and the possibilities of an assault suddenly delivered and pressed without regard to losses had been underestimated. Only two lines of defense had been provided. Once these were broken the enormous local superiority in numbers of the enemy told most heavily. Along the front attacked the assault pierced the British positions in four places. The faces of the Cambrai salient were first broken, the enemy storming in heavy masses much as in 1914. While their losses were enormous, at times half the attackers falling, ranks were promptly filled and the British line pierced and finally thrown back.

West and south of St. Quentin the enemy's progress was especially rapid, while at La Fère he crossed the Oise. Hopelessly outnumbered, with supporting batteries captured or out of action, the Fifth Army fell back, fighting. By the following day they had lost touch with the French to the south and the British Third Army to the north. In the center their line was pierced in two places. March 23 the line held was Arleux—Bapaume — Combles — Péronne — Ham —Chauny; from Péronne to the Oise the line suddenly began giving way that day, with a similar but more gradual collapse from Péronne north next day.

Attacks east of Arras on March 21 had forced General Byng's Third Army to give ground slightly on its right. It now had to withdraw still more to preserve contact with the Fifth Army, whose rapid retreat, now almost a rout, had left a sudden gap of about eight miles between the two armies. This gap, until the arrival of the French and Byng's reserves some days later, was filled by a picked-up force of engineers, truck drivers and other casuals, British and American, under the leadership of General Carey, who saved a desperate situation by prompt action.

The enemy's pursuit was rapid. From Monchy and Croissilles the army group of General Otto von Below, facing Byng, moved southwest on Bapaume, reaching Ervillers and Achiet-le-Grand on the 23d and 24th and forcing the British from Bapaume on the latter day. He reached Irles and the Ancre on the 25th, effecting a junction with the group of General von Marwitz, advancing from the south face of the Cambrai salient to flank Bapaume after rear-guard engagements at Ypres and Sailly-Saillisel and taking Péronne on March 23. These groups formed the northern wing, commanded by the Bavarian Crown Prince. South of this wing divisions of the German Crown Prince advanced more slowly.

Between St. Quentin and the Oise

the group of General von Hutier advanced rapidly, reaching Ham on the 23d and Nesle next day, and capturing Roye on the 27th after a fight at Etalon with French troops moved from Noyon to aid the British. After the fall of Roye the French withdrew from Noyon and Lassigny, but continued to extend their front to the west, keeping contact with the retreating British. Von Hutier continued fighting his way west on the 27th, gaining over 10 miles in 24 hours, reaching Montdidier and attacking heavily in renewed efforts to separate the British and French Armies. The French gave way slowly, still preserving contact with the British.

To the north the enemy advanced into his old 1916 positions, taking Albert and Bray on March 27. Albert is 14 miles from the essential railway junction at Amiens, which now became the objective of the German operations. The offensive slackened to the south while efforts were made by attacks east of Arras on March 28 and April 2 to widen the base of the salient. These attacks were repulsed with severe losses. Minor British successes were scored south of Arras, while a German attack west of Albert on March 31 was checked, and no further gains of importance north of the Somme were made in this region.

From the Somme to Montdidier and eastward to the Oise the enemy's attacks were continuous. Beginning March 23, French divisions replaced British from near La Fère until they had taken over an additional front of some 35 miles, extending through Montdidier and northward to the Luce. Gains here threatened both Amiens and Paris, and the enemy tried desperately to crush the French lines before they could be firmly established. He advanced between the Somme and the Luce, but was repulsed at Moreuil after small gains. French attacks around Montdidier on March 29 and 30 met with some success, and counterattacks wiped out German gains between Noyon and Montdidier, both sides losing heavily. After prolonged fighting the new front was becoming stabilized.

Marshal Foch Made Commander-in-Chief.—Announcement was made on March 31 that General Pershing had placed the entire American force at the disposal of the French command, a further announcement stating that the Allied War Council had vested supreme command of the Allied armies in Marshal Ferdinand Foch, Field Marshal Haig, General Petain, General Diaz, and General Pershing being at the head of the British, French, Italian, and American armies under him (see also II, *International Relations*). This unity of command and the great ability of Marshal Foch as a leader and strategist sealed the fate of the German offensives.

Germans Cross the Oise. — The French withdrew on April 5 after local attacks opposite Chauny; the Germans followed and crossed the Oise in force next day, advancing against the French right, gaining ground at the cost of enormous losses against delaying actions, the French taking up a strong defensive line of about 10 miles along the Ailette, joining the fronts east and west of the new line. Meanwhile German guns were arriving all along the fronts and active bombardments began everywhere, being especially heavy around Arras and Armentières.

The Second German Offensive, in Flanders.—By March 29 the threat against Amiens was brought almost to a standstill. The British had lost some 75,000 prisoners, largely wounded left behind, and 1,000 cannon and more machine guns. The Germans had suffered enormous losses, and while they had overrun the war-wrecked Somme battlefields, an imposing looking gain on the map, it was of little value unless they cut the Allied supply lines around Amiens or separated the British and French armies. This they had failed to do.

His exhausted troops failing to make progress against the British along the Ancre around Albert or the French along the Avre and around Montdidier, while the Allies had now had time to dig in and consolidate their positions, the German attack suddenly shifted to Flanders. Here General Horne's First British Army held a sector between Arras and Ypres. There had been little change in position since late in 1914. Here, as in Picardy, the German plan was to push through to the coast, separating and destroying the British armies to the north and throwing those to the south back in disorder upon the French.

After a short but destructive bombardment, the enemy attacked on April 9, on a 20-mile front from Givenchy to Ypres. The main attack fell on the front from Givenchy to Armentières, planned to throw the defenders back on the Lys, the objective being Hazebrouck, 15 miles west. This town commanded the roads and railroads to Ypres and Armentières and the British positions in Belgium. Other objectives were Béthune and Bailleul. The capture of these towns would force a withdrawal along the North Sea coast back to Dunkirk or Calais.

The first assault struck a Portuguese division holding front-line trenches in a sector of less than three miles before Laventie. Rushing through the gap made by the collapse of the Portuguese, the enemy advanced, spreading right and left and driving the defenders back on a 10-mile front to the Lys and as far west as the Lawe. Next day the enemy boldly crossed the Lys and Lawe from Estaires to St. Maur, cutting communications from south and west. Armentières was further isolated by an attack from Armentières to Messines. To the north, Messines Ridge and several villages were carried. Counterattacks regained Hollebeke and other villages, but Armentières was untenable and was abandoned on the night of April 10-11. To the south, desperate fighting around Givenchy and Festubert availed the enemy little. Both towns changed hands repeatedly, but before Béthune and north of Arras the British stood fast.

Along the Lys the advance continued, Merville, Neuf Berquin and Ploegsteert were fully occupied, Nieppe Forest and the railroad between Bailleul and Merris reached, Neuve Eglise entered, and the remnants of Ploegsteert Wood captured. By the 13th the enemy was within five miles of Hazebrouck. A British counterattack regained Neuve Eglise, but Béthune and Bailleul were seriously threatened. On April 12 Marshal Haig had appealed to his troops to "die where they stood, fighting with their backs to the wall." The advance was checked on all sides of the salient on the 14th after repulse of repeated frontal attacks on Bailleul, but the situation was still critical. Renewed attacks next day east of Bailleul carried hill positions. Outflanked on south and west, the defenders were driven from Bailleul on the 16th, while the capture of Wulverghem further threatened the positions around Messines Ridge.

Violent German assaults carried Wytschaete on April 16, the line of heights taken by the British in 1917 falling with it. These gains strengthened the northern side of the German salient and constituted such a threat against the Ypres salient and its communications that it became necessary to withdraw from the salient driven toward Roulers at such cost of life in 1917. The new front ran north from Hollebeke, through Zonnebeke and Poelcappelle to the old line near Bixschoote.

Counterattacks against Messines Ridge recaptured Wytschaete on April 17, temporarily halting the advance, but the enemy in turn recovered it and reported the occupation of Passchendaele, Poelcappelle and Lynmarck at the same time. By the 18th French reserves reached the lines around Bailleul and Kemmel, with American troops brigaded with the French and British. The German assaults were everywhere decisively repulsed.

Having failed to break in the northern pivot of the salient, the enemy attacked on April 18 on the south face, but was not able to pass La Bassée Canal after suffering very heavy losses. Operations lapsed to bombardments and small attacks. During these minor operations the enemy brought up special Prussian storm troops and Bavarian mountain troops, with a very heavy concentration of guns, and April 25 began a series of determined attacks against Ypres from the south and west. Carrying a seven-mile front from Wytschaete to Locre and Mt. Kemmel, they threatened to cut off the large number of troops in the Ypres salient. But all further attempts were sharply repulsed with severe losses, while the French recovered Locre.

The French took over a sector about five miles wide, including Mt. Kemmel, a solitary hill with steep slopes, on their arrival. It was a key point in the Ypres defenses. Against it General von Arnim threw his fresh divisions of storm troops. Stopped in front of Mt. Kemmel, the enemy, using his "infiltration" tactics, worked through the lines on either side, took the villages of Kemmel and Dranoutre against stubborn resistance and, pressing ahead, closed in rear of Mt. Kemmel, isolating the French regiment which had been left to hold it, and did so into the following day until all were killed, wounded, or captured. The capture of Mt. Kemmel forced a withdrawal south of Ypres. From Wytschaete the line fell back two miles to Voermezeele, thence through Zillebeke and behind the Steenbeck. Thinking this the beginning of a general withdrawal, the Germans advanced only to be severely checked by British and Belgian reserves, and the offensive again halted.

The enemy speedily organized another series of attacks on April 29 between Mettern and Zillebeke Lake, but was again thrown back with very heavy losses. Attacks on Ypres from the north were repulsed, and the French once more regained Locre, taken the second time with the fall of Mt. Kemmel. Operations settled down to a series of small engagements, the Allies taking the offensive.

On May 8 two German divisions again attacked south of Ypres, between La Clytie and Voormeezeele. On the French sector they were repulsed, but south of Dikebush Lake they forced back the British line, which recovered the position by counterattacks that night. North of Kemmel and west of these last attacks activities were resumed next day, but gains were small and a prolonged period of quiet began, broken by occasional allied raids and reconnaissances. Allied attacks around Locre and Merville on May 19 and 20 improved their positions, while the German troops on Mt. Kemmel were subjected to a destructive and continuous bombardment. The German offensive in Flanders had been halted.

Operations on the Somme and Oise.—Meanwhile in the Somme-Oise salient the Allies remained on the defensive. German attacks on April 12 between Hangard and Hourges momentarily took Hangard, but French counterattacks drove them out, the town changing hands several times in desperate fighting. French attacks gained southeast of Montdidier the same day. A series of attacks from the 12th to the 18th around Hangard, Thennes, Mailly-Raineval and Castel followed, the advantage being, with the French.

A heavy bombardment on a 15-mile front was followed on April 23 by a strong attack against the eight-mile front between the Somme and the Avre, directed at Hangard and Hailles, held by the French and Americans, and Villers-Brettoneux, held by the British. The fighting was continuous to the 26th. From Hailles to Hangard the line held, but Hangard was lost, recovered, and lost again. Villers-Brettoneux was lost in fighting featured by duels between British and German tanks. French counterattacks on April 26 restored the lost positions at Villers-Brettoneux and Hangard Wood, and south of the Luce recovered the western edge of Hangard, while they repulsed seven attacks against Hangard Wood.

The American 1st Division before Amiens, south of Grivesnes between Cantigny and Fontaine-sous-Montdidier, repulsed determined attacks on April 30. Simultaneous French attacks north and south of the Avre gained ground and prisoners, and again on May 9 at Grivesnes, while next day they repulsed an attack near Mailly-Raineval and made further gains northwest of Orvillers-Sorel, and south of Hailles captured woods west of the Avre and improved their positions.

German attacks on May 14 near Morlancourt were followed by British counterattacks, regaining most of the ground, though the enemy retained Morlancourt, whence a move of a few miles westward threatened the British bridgehead on the Ancre. To forestall such action and to improve the British position Australian troops from Lens attacked on the night of May 18 at Ville-sur-Ancre, two miles north of Morlancourt, capturing the village and a ridge overlooking the latter town. Another of these operations to strengthen the Allied front took place at Cantigny on May 28, when the American 1st Division, under Major-Gen. R. L. Bullard, after repulsing a stiff attack the day before, stormed and held that strongly fortified village and adjacent objectives (see also XI, *The Army*).

Minor Operations on Other Fronts.—During these operations in Picardy and Flanders operations elsewhere were of a minor character, bombardments, raids and local operations in the Vosges, around Verdun, in the Argonne and along the Chemin des Dames, designed to prevent the sending of assistance to the fighters further west. Among the lesser operations of the period were several German raids against American-held trenches in the Toul sector. Companies I and L of the 9th Infantry (regulars) were decorated by the French for gallantry in repulsing an attack on April 14 in the St. Mihiel salient, and Brig.-Gen. Peter Murray, U. S. A., was highly praised for excellent work in repelling attacks "on the Meuse, south of Verdun." The largest of these attacks occurred on April 19, when a picked storming force of 3,000 Saxon troops attacked and was completely repulsed after some initial success on a two-mile front before Seicheprey, near the center of the south face of the St. Mihiel salient (see also XI, *The Army*).

Third German Offensive, on the Aisne.—Apparently convinced that the attempt to drive through to the Channel was a failure and promised no success commensurate with the enormous casualties they had suffered, the Germans attacked on May 27 on a front of 35 miles from Anizy to Berry-au-Bac, opposite Soissons and Rheims, in a thrust at Paris.

The extension of their front by some 50 miles in the Amiens salient and the necessity of maintaining a large reserve to meet any enemy attack had resulted in thinning the French lines wherever a man could be spared. The most favorable route to Paris is down the region between the Aisne and the Marne, to which Rheims is the best gateway. Here the French remained in force. The roads leading past Soissons, defended by the Aisne, the Vesle, and the hill positions at the western end of the Chemin des Dames, presented such difficulties as were likely to discourage attack. Before Soissons the line was rather lightly held by four French divisions, thence east to near Rheims by four British divisions, worn down by hard fighting in Picardy and sent here, as to a quiet sector, for rest. The necessity of returning to front-line duty divisions so recently heavily engaged indicates somewhat the difficulties faced by the Allied Commander-in-Chief. The French reserves had been concentrated near the junction of the French and British fronts, toward Amiens, and only light reserves held in the area where the actual attack developed.

Before their March offensive the enemy had built and repaired communications along this front. He was now able to use them without attracting attention to his unusually heavy troop and supply movements. Taking advantage of his interior lines and being able to conceal his movements, he brought up by night marches the armies of von Boehm and von Bülow, 20 divisions, some 300,000 men, and after an artillery preparation lasting 2½ hours, struck without warning at 3.30 a. m. on May 27.

Tanks and picked troops quickly swept over the front-line trenches, while a heavy bombardment of the areas in rear with gas shells added to the straits of the 100,000 Allied defenders. The attack fell with greatest force on the French west of Craonne. They gave way, seemingly offering only sufficient resistance to make withdrawal possible and avoid loss of contact between the Allied forces. Doubtless the Aisne was thought such an obstacle as would allow the defenders, if forced back, to hold until reserves could arrive. But so sudden and overwhelming was the attack that they not only failed to stop the enemy north of the Aisne, but were themselves driven beyond the Vesle and all but destroyed, the Germans claiming the capture of 35,000 prisoners, mostly French, and hundreds of guns. The French center withdrew most rapidly, crossing the Aisne at Pont Arcy that afternoon, while to the east a German force also crossed and pushed ahead to the Vesle. The British were forced back towards Rheims. The Allied situation was as grave as during the March offensive.

The Germans now began a violent and ceaseless attempt to push south to the Marne, thence westward to Paris. Meanwhile they strove to wipe out the Rheims salient and also to advance down the Aisne toward the Oise, joining the new Marne salient with the salient toward Amiens. Success in either of these two secondary efforts would so widen the base of the Marne salient as to allow them to press the advance on Paris with greater ease and promise of success.

The French paused at Fismes and south of the Vesle next day. German attacks north and northwest of Soissons were repulsed, but after taking Condé and crossing the Aisne on May 29, they thrust strongly westward, forcing the French to the western edge of Soissons next day. South to Hartennes and along the Vesle front, their advance continued until briefly halted by the French May 30, some 12 miles south of the river along the line Fère-en-Tardenois—Ville-en-Tardenois. British and French troops were forced back almost into Rheims itself.

From Fère the French were soon swept back beyond the Marne, the enemy pushing on and reaching the north bank from Chartèves to Jaulgonne on May 31 and spreading east and west along the river to Verneuil and Château-Thierry on June 1. They crossed at Jaulgonne on June 3, but were driven back by the American 3d Division (regulars), fresh from a training sector. Its motorized machine-gun battalion had preceded it and had held the bridgehead opposite Château-Thierry, the bridge being blown up and the enemy troops that had crossed captured. However, the enemy had established a wide and stable front along the north bank and had cut the important Paris-Chalons-Nancy railroad. The route to Paris ran west along the Ourcq through the Soissons-Château-Thierry front.

Forced to the western edge of Soissons on May 30, the French held on doggedly, organizing the line southward through Oulchy to Château-Thierry with all available troops to hold this vital front. The enemy attacked heavily on May 31. Around Soissons they were repulsed, but at the center near Oulchy they gained and advanced down the Ourcq, forcing the French back five miles to Chouy and Neuilly. Next day they again advanced, their gains along the Ourcq forcing the line to the north to fall back to the edge of the forest of Villers-Cotterêts, the enemy advancing to a line including the villages of Longpont, Corty, Faverolles and Troesnes. Meanwhile Allied reserves were arriving along this vital front.

The American 2d Division, commanded by Major-Gen. Omar Bundy, U. S. A., and composed of the 5th and 6th Regiments of Marines and the 9th and 23d Infantry (regulars), was rushed up in motor trucks from near Montdidier. They at once counterattacked, regaining the positions named. The enemy redoubled his efforts on June 1, recapturing Faverolles only to lose it next day, while Mont Choisy was captured, lost and retaken five times in a few hours. The American division captured the village and railroad station of Bouresches and held its ground against the enemy's crack Guard divisions. Without full artillery support, their own guns not yet being up, the Marine Brigade under Brigadier-General Harbord, U. S. A., took Belleau Wood, stopping German assaults, and for eleven days met and repulsed repeated heavy attacks, inflicting much heavier losses on the enemy than they suffered themselves. At Neuilly Wood the enemy forced the Americans back and began establishing a line of machine guns, but a prompt counterattack with the bayonet drove him out. (See also XI, *The Army.*)

Attacks near Soissons and Château-Thierry on June 2 and 3 attempted to advance the line even with the gains made down the Ourcq. West of Soissons they gained five miles, taking Prenant, but around Château-Thierry they were halted at Bouresches in the American sector, where repeated attacks resulted in little change.

The Germans delivered a violent attack on May 30 north and west of Soissons between the Oise and the Aisne, attempting to reduce the French salient. It forced the French back to the high ground covering Blérancourt and Epagny. On June 1 they were again forced back to a line including Carlspont Wood and the heights west of Andignicourt, thence through Hautebraye to Ambleny. French counterattacks on June 5 regained Vingry and LePort, improving their position in this area. Efforts to break in the Rheims salient proved unavailing. The front from Dormans northeast to Rheims was repeatedly attacked but without material gain. Local attacks on the east took Fort Pompelle, but the French recovered the position.

Fourth German Offensive, on the Oise.—The enemy attacked suddenly on June 9 on a 20-mile front between Noyon and Montdidier in an effort to break the pivot of French resistance west of Soissons and open the roads to Paris from the north through Compiègne. Striking with some 20 divisions he penetrated the French center, carrying Mareuil-la-Motte and Ressons-sur-Matz, but was repulsed among the hills and woods along the Matz. On their left the French lost and regained Courcelles several times, finally retaining it.

Unlike the previous offensives, this one failed to break through. The French were prepared and not surprised, while reserves were close at hand. The enemy began a series of local attacks, gaining some ground but at enormous cost, the French giving way slowly. The capture of Cuvilly and Thiescourt Wood caused the French to withdraw southward from the hill positions, now outflanked, and take up a position south of the Matz. In the center the German pressure kept up, advancing their line to the Aronde on June 10, where the French halted and struck back sharply, throwing the enemy back on Belloy and Marquéglise and recovering Vandelicourt. Continuing these attacks next morning on a front from Rubescourt to St. Maur, aided by many tanks, the French recovered Belloy, St. Maur and Antheuil and the ground around Courcelles, while their right repulsed repeated attacks along the Matz on the 12th and 15th. In repeated attacks on the Matz positions on the morning of the 12th the Germans gained crossings at a cost of very heavy losses, only to be thrown back across the stream that night with even heavier losses.

East of the Oise the French withdrew, maintaining connection with the line on the west, while enemy attacks gained between the Aisne and Villers-Cotterêts Forest, threatening the northern edge of the forest. Local counterattacks on June 15-18 recovered lost ground here and to the east, and an attack northwest of Hautebraye on June 16 strengthened the defense in that sector. The fighting in this fourth offensive had been as severe as any during the entire war. The Germans had used 40 divisions and their losses had been enormous, but their efforts to reach Compiègne and open that road center had failed.

On June 18 the enemy attacked east and west of Rheims on a 10-mile front. On the French left they were repulsed by artillery fire. Three divisions ordered to attack and take Rheims regardless of losses were repeatedly repulsed with enormous losses. East of Rheims they gained a footing in a wood southeast of Sillery only to be promptly ejected.

Operations along the Western Front now slackened to minor attacks, chiefly by the Allies, to improve defensive positions, to restrict enemy movements, and also for purposes of reconnaissance. One of the most important of these was on June 26, when the American 2d Division completed the clearing of Belleau Wood in stiff fighting against a thoroughly organized hill position studded with machine gun nests; and on the night of July 1 the 9th and 23d Regiments of Infantry in a brilliant attack took the village of Vaux, two bits of adjacent woodland, and a stretch of the Paris highway, wiping out a salient along the Marne and thence northwest toward Belleau Wood on a front of 1½ miles to a depth of 1,000 yards (see also XI, *The Army*).

The French advanced 1¼ miles on

a four-mile front southwest of Soissons on June 27, repulsing counterattacks, and on July 7 followed this up with a night attack seven miles northwest of the city, capturing three positions on a front of two miles one-half a mile deep, while on July 1 they took Hill 204, southeast of Vaux. Troops of the British Fourth Army and the 27th and 30th American Divisions captured Hamel with 1,300 prisoners on July 4. The enemy failed to make any determined reaction.

Taking advantage of the radiating lines of communication through Compiègne and the Allied reserves in that strong defensive area, which could threaten and support lines in either direction, more than a dozen successful operations of moderate proportions and many raids were carried out. The German high command was finding that the change from trench warfare to the war of movement did not bring all the advantages anticipated. Their policy had been to hold their forward trench positions with second-rate troops, holding in rear their selected and shock divisions. With a greatly lengthened front, their armies reduced by enormous casualties among their best troops in the four costly offensives, the enemy, though still numerically powerful, was being put to it to meet the constant secondary attacks being made by the Allies along the forward positions.

Around Longpont and along the eastern edge of Villers-Cotterêts Forest, the French advanced on July 8, 12 and 13, gaining a high salient of open farm land overlooking their lines and affording the enemy a jumping-off place for further attacks, and finally carrying the line across to Savières. West of the Oise a heavier French thrust on a 2½-mile front advanced more than a mile, recovering ground lost in the June 9 offensive. The enemy made little or no effort to recover it. Castel, on the Avre east of Amiens, was taken in a spirited local attack on July 12 and the enemy driven from his positions on the Rouvrelles plateau.

Fifth German Offensive: Rheims and Château-Thierry to the Argonne.—Halted in Picardy, in Flanders, between Soissons and Rheims, and finally in his Compiègne-Oise offensive, Ludendorff, unless he gave up his chance of winning the war or concluding a favorable peace, was compelled to resume his offensive operations before the arrival of the fast-coming American troops made it impossible for him to win. His final "peace storm" was launched on a grand scale against the Rheims salient and the French line east to the Argonne.

The German artillery preparation began at midnight on July 14-15 along the front from Château-Thierry to Main des Massiges at the western edge of the Argonne, some 60 miles. The French guns, prepared and on the alert, at once delivered an intense counter-bombardment, severely hampering the enemy's movements. The German infantry advanced at 4.30 a. m. Against Rheims itself the attacks were light, being intended merely to hold the defenders in their positions. East and west of the city independent and somewhat disconnected battles occurred. West of Rheims von Boehm's armies attacked the Marne line on a 15-mile front from Château-Thierry to Dormans, while to the east von Below attacked from Prunay to Main des Massiges. Here Gouraud cleverly utilized the "elastic defense," withdrawing at Prunay about a mile to the south of the Vesle and further east, south of Moronvillers, about four miles to a line south of the Roman Road. By the 16th the enemy had been definitely checked with severe losses by Gouraud's French and American troops, the 42d Division ("Rainbow," National Guard) being in the line north of Suippes, where it stopped the enemy's advance.

The Marne was held along the south bank from Château-Thierry east through Mézy by the American 3d Division (regulars) and through Jaulgonne and to the east by French troops. Along this front the enemy endeavored to cross at numerous points while forcing the main crossing at Jaulgonne. The heavy American fire repulsed attempted crossings at Château-Thierry, while American machine gunners along the bank eastward to Fossay, some four miles, delayed their crossing for some hours. Under cover of a powerful artillery concentration and using smoke screens, the enemy, however, in canvas boats carrying 20 men, crossed a division to the south bank after enormous losses and about 10 a. m. drove back the American line opposite them, allowing other divisions to cross and clear the bank east to Mézy.

The 38th Regiment of Infantry (regulars), after repulsing the enemy in their front, were attacked in front and on both flanks by troops who had crossed to their right and left. Keeping up a fire in three directions and with gallant counterattacks, they held the position. Aided by American counterattacks the two enemy divisions were thrown into confusion and by 3 p. m. had been driven back across the river, one German battalion being wiped out and 1,000 prisoners taken, while an American platoon that had held out in Mézy was rescued.

At Jaulgonne, where the enemy had crossed on June 3 only to be driven back across the Marne by the Americans, the river bend forms a salient dominated by the high ground across the river. Here and to the east the enemy effected crossings, after heavy losses and considerable delay, and pressed four miles to the south, taking Crésancy, Condé Wood, St. Agnan, La Chapelle, and Monthodon. Other troops, after crossing, moved east along the river, taking Dormans and advancing to Moreuil, five miles beyond, where the French on the high ground between Moreuil and Leuvrigny stopped them.

By the following day the enemy was pouring troops and supplies to the south bank over six pontoon bridges. Although the advance eastward reached Châtillon on the north bank and Festigny on the south, threatening to cut in through Epernay and capture Montagne de Rheims, cutting off the troops in the Rheims salient, the enemy could make no progress to the south. To the west he pushed down to Gland, again occupying Mézy.

These movements, extending the line east and west with the Marne close in rear, afforded an opportunity for attack at once seized by the French and American troops. Striking the enemy center, they quickly recaptured the villages of St. Agnan, La Chapelle and Monthodon, gained the hills to the north overlooking the Marne, and forced the enemy back to within two miles of that stream.

The Allies Launch Their Counter-Offensive.—By the morning of the 17th the crisis had been reached. Checked and driven back south of the Marne, the enemy still threatened Montagne de Rheims, having gained a foothold in Courton Wood. East of Rheims he had crossed the Vesle and threatened from that side, while the Italian divisions holding the lines at Rheims itself were being slowly forced back along the front from Bligny to Pourcy. While the Allied lines had given ground, however, there had been no sign of break or confusion. German reserves had been poured in lavishly and their losses had been terrible. In spite of large gains of ground and the prophecies of their leaders, Allied resistance only became the stiffer the longer the battle raged. Moreover, over a million American troops had arrived in France, and more than 250,000 had been in action and proved themselves fit to be classed as "shock troops." The Allies had weathered the "peace storm." The time for the counter-offensive had arrived.

Marshal Foch could strike north and west from south of the Marne around Rheims and Epernay, in frontal attacks involving heavy losses, or from the Soissons-Château-Thierry front against the exposed right flank of the enemy's deep Marne salient. He chose the latter, and for the vital blow immediately south of Soissons selected the famous Moroccan divisions, the American 1st Division which had won fame by its capture of Cantigny, and the 2d Division, heroes of Belleau Wood and Vaux. The group was commanded by Gen. Joseph Mangin. Apparently the Germans were deceived both as to the strength and location of the Allied reserves; in fact they had announced that Foch had no strategic reserves left.

The weather favored the enemy, as the morning of July 18 found the rain falling in sheets, while high winds made airplane reconnaissance difficult and artillery observation almost impossible. Under cover of the storm and the forests of the Villers-Cotterêts region, the divisions of Mangin southwest of Soissons and of de Goutte northwest of Château-Thierry were moved up, together with some 800 swift "mosquito" tanks. Without the usual warning of a preliminary bombardment the Allied artillery laid a rolling barrage at dawn, firing by the map. The German artillery was caught napping and their front line, taken by surprise, gave way.

On a 30-mile front from the Aisne to near Château-Thierry the gains averaged 3½ miles. On the left Mangin advanced until he gained the hills dominating Soissons from the southwest. Near the center, along the Ourcq, the enemy resisted to greater advantage and the advance was only two miles. Northwest of Château-Thierry de Goutte's French and Americans advanced some four miles. The enemy's lightly held front lines, under their system of "elastic defense," were hastily thrown back, involving and breaking his lines in rear, the Allies reporting the capture of 20,000 men and 360 guns, part of which were taken by French cavalry which was poured through the breaks in the line and did excellent service in pressing the retreat.

The French made no special effort to take Soissons, but kept it under artillery fire and advanced to the south of the town. The enemy brought up large numbers of reserves and made a stubborn defense with machine guns and artillery for several days in an effort to make it safe for their troops to remain south of the Marne. They attacked with Prussian shock troops between the Ourcq and the Marne on July 22 without success. The Allies advanced south of the Ourcq, beyond La Croix and Grisolles, and next day captured Rocourt and Châtelet Wood. The advance up the Ourcq threatened to cut off the troops south of the Marne, and they began withdrawing across the Marne early on July 20, pressed by the smaller French and American forces on that front, who inflicted heavy losses, especially as the withdrawal of the German artillery left the infantry unsupported under heavy Allied fire.

The 3d Division continued its attacks, taking Mt. St. Père and the villages of Chartèves and Jaulgonne in the face of machine-gun and artillery fire. By the 24th the last enemy bridgehead at Jaulgonne was driven across the Marne by the Americans.

The 26th Division, near the Ourcq, was the pivot of the advance toward Soissons. It captured Torcy on July 18 and attacked again the 21st, driving the enemy back across the Château-Thierry-Soissons road; Château-Thierry was evacuated by the enemy that day, as de Goutte's advance in the Priez and Courchamps areas left it in such position that it could not be defended. The enemy fell back from Trugny and Epieds on the 24th, and the 42d Division, relieving the 26th, pressed forward through the Forest of Fère, wiping out enemy machine-gun nests and reaching the Ourcq on July 27, when it advanced in cooperation with the 3d and 4th American and French divisions.

At the north end of the line the 1st Division advanced fighting for five days, capturing Bergy-le-Sec and the heights above Soissons. The 2d Division, having taken Beau Repaire farm and Vierzy, arrived opposite Tigny on the 19th. Of the prisoners and guns captured these two divisions had taken 7,000 men and over 100 guns.

The Allied gains outflanked Oulchy-le-Château and Oulchy-la-Ville, which had held up Allied progress along the Ourcq, and French troops striking the retreating enemy here on July 25 took both towns and the hills commanding the north bank of the Ourcq. The Allied objective was now Fère-en-Tardenois, through which important road center the German supply lines passed. South of the Ourcq the enemy was finding himself in cramped quarters, much mauled by Allied artillery. French and American troops crossed the river and took Fère on July 28 in desperate hand-to-hand fighting.

After crossing the Marne the 3d Division had advanced into Ronchères Wood on July 29, when it was relieved by the 32d, which now advanced with the 42d, taking the heights beyond Cierges. The 32d took Hill 230, while the 42d captured Sergy, Seringes, and later Villers-sur-Fère and Nesles. The 42d was relieved by the 4th Division, and the 32d by the 28th and the line, joined by the 77th Division, moved up to the Vesle. These divisions along the Vesle belonged to the Third Corps under Major-Gen. Robert Lee Bullard.

The French and British around Oulchy advanced on July 29, taking Grand Rozoy, Cuquy and Butte Chalmont, repulsing attacks next day, and on August 1 forcing the enemy from important positions northwest and southeast of Fère. North of Fère the American advance had reached the edge of the wooded heights, while to left and right French and American troops advanced to the northeast along the Oulchy-Fismes and Courmont-Fismes roads.

By posting strong infantry and artillery forces near Rheims and Soissons, Ludendorff meanwhile took steps to prevent being outflanked or cut off by attacks at the base of the salient. He retained his hold on the eastern end of the Marne front from Verneuil to Chatillon until July 25, then began withdrawing to the line Oulchy-Fère-en-Tardenois-Ville-en-Tardenois, removing or destroying guns and supplies. The withdrawal was skillfully effected. While the rear guards could not stop the Allied advance, the Allies were unable to engage and hold in place the retreating main body, but on July 25 and 26 pushed ahead through the Fère and Riz forests, advancing abreast of the Allied forces to the west along the Ourcq, and on July 28 to the east, reaching the line Champvoisy-Authenay-Olizy.

West of Rheims the enemy attacked heavily on July 25 and 30 and August 1 around and south of Ste. Euphraise to aid in holding that essential pivot. In Champagne Gouraud's Fourth French Army attacked on July 26 on a wide front, taking Main de Massiges and the ground given up in meeting the offensive of July 15.

In the face of constant Allied pressure the enemy could neither halt in a defensive position nor himself resume the offensive. Mangin advanced into the area just south of Soissons, attacking on Aug. 2 across the Crise and advancing five miles, while to the north some of his troops entered Soissons, the enemy withdrawing without offering serious resistance. French cavalry and tanks advanced that evening to the Aisne near Venizel.

After taking Grand Rozoy, de Goutte advanced with his left northeast across the hills north of Fère, while his American divisions moved north on Coulonges, east of Fère. His left reached Bengneux on Aug. 1, and shoving the enemy rear guards rapidly ahead, advanced through Arcy, Sainte Restitue, Dole Wood, and toward Braisne and Fismes on the Vesle.

The American divisions from Munière Wood took Coulonges on Aug. 2 and advanced on Fismes. French troops joined up on their right, entering Romiquy, and the entire front reached the Vesle on Aug. 3, the Americans in the center at Fismes, the French on the west near Braisne and on the east near Jonchery. American troops stormed Fismes that afternoon, and the Allied troops were soon in possession of the entire southern bank except at the junction of the Vesle and the Aisne. Small detachments were thrown across the Vesle next day, meeting determined resistance, but held their ground until the 7th, when additional troops crossed and advanced the line on a four-mile front from Fismes to west of Bazoches to the road and railroad on the north. On Aug. 9 American troops captured Fismette, opposite Fismes, by a sudden thrust, and consolidated the new position with those already gained across the river.

While de Goutte and Mangin were thus clearing the Ourcq line to the Vesle, British and French divisions on the east side of the salient around Ville-en-Tardenois likewise advanced on Aug. 2, passing through that village, taking Goussaincourt and Villers-Agran, and advancing to the Ardres River. Other troops moved west from near Rheims along the north bank of the Ardres, reporting the enemy withdrawing, and took Gueux and Thillon and moved to the south bank of the upper Vesle on Aug. 1. The Vesle, a small, straight stream, commanded by the higher ground to the north, could not be outflanked readily from the west as the Ourcq and Marne had been. Accordingly the attack here paused, the enemy being later forced from the position by advances elsewhere.

In their anxiety to hold the Soissons and Rheims pivots of their salient to prevent the troops of the German Crown Prince from being cut off, the reserves of the armies of Crown Prince Rupprecht in Picardy and Flanders were heavily drawn on. Though not under attack, the Germans now withdrew from a small salient north of Albert, falling back to a better defensive position behind the Ancre. Similar movements occurred on Aug. 4 at Castel and at Mesnil-St. Georges near Montdidier, the enemy withdrawing to the east bank of the Avre, promptly followed by the French, who pushed ahead, entering Broches and Morisel on the 6th and gaining more ground at Mesnil-St. Georges next day. The enemy withdrew also on Aug. 5 north of La Bassée.

Allies Wipe out Amiens Salient.—Following the German withdrawals in Picardy, an Allied attack was made on Aug. 8 at 5 a. m. on the front from Montdidier to Albert. After a very brief artillery preparation a large force of both heavy and light tanks advanced and reduced the German front positions in a few hours. Between the Somme and the Luce Rawlinson's Fourth British Army advanced on Chaulnes, while south of the Luce Debeney's First French Army covered the British right, crossing the Avre and capturing Moreuil. By the following day the British center was approaching Lihons, their cavalry and whippet tanks on the heels of the fleeing enemy's artillery and supply trains. To meet this pressing danger all the available German reserves were moved to cover Chaulnes. While they were thus engaged the French uncovered their principal attack, moving on the afternoon of the 9th from their lines south and southeast of Montdidier on Faverolles, cutting off the German line of retreat to the east on Aug. 10. The French troops north of the town advanced in conjunction, and Montdidier, surrounded, was surrendered at noon with several thousand prisoners and quantities of stores.

To the north the British kept the enemy and his reserves fully occupied along the front from Roye to the Ancre, where British and American troops stormed Morlancourt on Aug. 9th and continued their advance. South of the Somme they captured Bouchoir, Meharicourt and Lihons, repulsing counterattacks near Lihons on Aug. 11 and 12. Meanwhile the French took advantage of the situation to the north to continue their advance all along their front from east of Montdidier as far as the Oise. Crossing the Matz, they took Elincourt, Neuville-sur-Ressons and Moreuil-la-Motte. Further west they took the hills around Boulogne, and also advanced up the Avre, approaching Roye from the southwest on Aug. 12 and taking Loges Wood, between Roye and Lassigny. Continuing, they advanced on Aug. 14 to the edge of Plessier-de-Roye, bringing up much artillery and commencing a heavy bombardment of Lassigny and along the entire front. To the south and east their lines advanced, to conform to these movements, through Cambronne and Ribecourt, and east to the Oise at Pimprez, advancing on Noyon.

The British north of the Avre and the French southeast to the Oise kept up a constant pressure of local attacks, making it impossible for the enemy to take out any of his reserves, and continued the Allied advance on Roye and Lassigny in spite of frequent counterattacks. Canadian troops took Damery and Porvillers, between Roye and Chaulnes on Aug. 15, and continued the advance on Fresnoy and Fronsart. The French advanced eastward, taking Goyencourt, St. Mard and Lancourt, and to the south the eastern edge of Loges Wood and Canny-sur-Matz, and took Fresnières on the Roye-Lassigny road on Aug. 19, reaching the outskirts of Lassigny, now approached from north, west and south. The Germans withdrew from Lassigny on Aug. 21, exposing their left flank near Roye and opening the road to Noyon. Next day the French gained the only serious obstacle between themselves and Noyon, the Divette.

On Aug. 18 Mangin commenced an operation east of the Oise to conform the lines there with operations to the west. Aided by the light tanks, he attacked on a nine-mile front after a brief artillery preparation, his left advancing on Carlepont Wood, his right on heights west of Nampcel. Progress was very rapid, the tanks readily breaking up machine-gun positions on which the enemy's "depth defense" system was based. The center took the Nampcel heights and the right Andignicourt, Vassens and Morsain. Attacking on Aug. 20 on a 15-mile front 10,000 prisoners and numerous villages were taken, the center firmly established in the hills, the left moving along the left bank of the Oise. Next day Cuts was taken, and, approaching Noyon, the advance reached the Oise below Pontoise, having passed around a German force in d'Ourscamp Forest, and moved through Blérancourt and Corneten, clearing the angle at the junction of the Ailette and the Oise and reaching the Ailette on Aug. 22.

British Offensives around Armentières and Arras.—The British attacked on Aug. 17 near Merris, and next day at Merville, near the apex of the salient directed at Hazebrouck. Renewing the attack at Merville on a five-mile front on Aug. 19, they took the village and adjacent ground and next day drove the enemy from four villages.

On Aug. 22 General Byng's Fourth British Army and the Second Corps of the American Army, the 27th and 30th Divisions under Major-Gen. Geo. W. Read, advanced on Bapaume on the front from Moyenville to Beaucourt, those villages and Achiet-le-Petit, in the center, being taken along with Logeast Wood. The advance crossed the Arras-Albert railroad. The British attack then shifted to the south of Albert, involving a new front along the high ground there. Here the British entered Albert and advanced across the German front line position along the Ancre and on the north to Achiet-le-Petit, and by the 23d they had gained the east bank of the Ancre and captured Achiet-le-Grand and Bilnecourt. German reserves rushed up to the west of Bapaume to meet the advance were defeated at Miraumont after severe engagements, and a new thrust to the north took Sapignies, two miles north of Bapaume, on the 25th. Next day English and Welsh troops advancing from Albert took Montauban, and after capturing and losing finally held Longueval. New Zealand troops entered Bapaume from the northeast on Aug. 27. Gains here were aiding the advance along the Scarpe, while the troops at Montauban and Longueval threatened Combles and Péronne, advancing along the Somme south of Combles through Curlu, Hardecourt and Maurepas.

On Aug. 23 the British began an advance from Arras down the Scarpe, extending the front of their offensive by sending in troops released by arrival of French to the south after many of the German reserves had been put in action south of the Somme. Fighting over the ground where early in 1917 they had been checked, the British advanced rapidly through Ervillers, Hamelincourt, Boyelles and Boiry-Becquerelle, on the German advanced lines, to the enemy's main positions on the Sensée and astride the Arras-Cambrai road, and continued their gains in spite of bitter resistance. By the 26th the operation had extended north of the Scarpe and the advance continued, taking Monchy-le-Preux and Wancourt to the south and Roeux on the north bank. German reserves thrown in north of the Scarpe on Aug. 27 were repulsed and Arleux and Gavrelle occupied, while to the south Canadian troops advanced to the Sensée, taking Fontaine-les-Croisilles, Chérizy and Vis-en-Artois, beyond their farthest line of advance in 1917. Other troops took Croisilles next day.

While the Fourth Army was operating against Bapaume, another British force took Bray on Aug. 24, and Canadians captured Cappy and Suzanne two days later. To the south a part advanced along the Estrées-Vermand road, taking Foucaucourt on Aug. 28, while Australians took Herbecourt and advanced into the river bend just west of Péronne. These movements kept the Allied advances to the north on Bapaume and south on Roye and Chaulnes protected on the flanks. Sudden attacks by the Australians on Aug. 31 advanced to the town, and next day in house to house fighting they took Péronne with about 3,500 prisoners and pushed on east and north, clearing St. Vaast Wood and Allaines, the enemy retiring on St. Quentin.

French Take Roye and Chaulnes and Encircle Noyon.—French troops, released by the shortening of the front after the capture of Montdidier, were moved to the north and took over a part of the line from the British before Roye and northward. The change was successfully made about Aug. 25 and next day they attacked, taking St. Mard, Fresnoy-les-Roye, and reaching the Roye-Péronne road. A determined thrust on the 27th resulted in the capture of Roye with 1,100 prisoners and an advance of two miles to the east. Chaulnes, already flanked on the south, was captured on Aug. 28, the advance extending to and including Nesle and a line along the canal from Cizencourt to east of Nesle, and south to Noyon, a forward movement of some seven miles that day.

After their advance to Evricourt and the Divette valley from Lassigny, the French approached Noyon from north, west and south in a series of small attacks, minimizing losses. Mt. Renaud, southwest of the town, stopped the advance, but after this and other positions were reduced, the enemy withdrew from Pont-l'Evique to the south, the town being thus closely approached on three sides and by Mangin's army across the Oise. The Germans withdrew on Aug. 29 to avoid being cut off, holding the hills east of town and preventing immediate pursuit. North of the town the hills and the Somme-Noyon Canal aided the withdrawal. The French crossed the Canal near Catigny and Beaurains and took Mt. St. Simon on Aug. 30, fighting cautiously eastward. As the situation developed, the withdrawal up the Oise to the 1917 lines became more rapid, and the French entered Guiscard and Ham.

The Advance South of the Oise.—South of the Oise Mangin continued his movement eastward into the hills north of Soissons by a succession of attacks between Soissons and the Ailette with an occasional thrust northward toward Coucy. He was seeking opportunity for a rapid advance into the Chemin des Dames positions along the Aisne, to take in rear the Germans still holding the Vesle line.

In these operations the American 32d Division (Michigan and Wisconsin National Guard, Major-Gen. W. G. Hahn) played a prominent part, being assigned the capture of Juvigny, two miles north of Chavigny. They accomplished this mission after two days of severe fighting on Aug. 29 and 30 against a fresh division sent in to halt them. After the capture of Juvigny the French troops on right and left moved up and the advance continued, French and American troops taking Terny-Sorny and Leuilly on Sept. 2. Next day the Allies reached Bucy-le-Long and Clamecy, while north of the Ailette they advanced to Coucy-le-Château and Jumencourt after crossing at Champs on Aug. 30. Secure in his positions north of Soissons, Mangin struck east up the right bank of the Aisne on Sept. 4, advancing through Bucy-le-Long, Moncel, and Missy and occupied Condé and Viel-Arcy on the 5th and 6th.

Crossing near Vailly, he was seriously threatening the Vesle line, and German attacks at Laffaux tried to stop the advance across the Vailly-Laon road but were repulsed. The advance here was not pushed as the Allied plans called for Mangin to operate northward in conjunction with the movement on La Fère. He advanced, keeping touch with the force across the Oise, through the lower forest of Coucy, taking Barisis on Sept. 7 after hard fighting, and occupied Aulers and Bassoles, pushing his left forward between the upper forest of Coucy and the Oise to within four miles of La Fère, taking Servais on Sept. 10. Here the Coucy Forest and the St. Gobain Massif, in German hands, restricted his front and limited operations, and Mangin once more began to thrust eastward and northeast against bitter resistance and determined counterattacks by picked troops. It was essential, if the Germans were to hold their 1917 lines, that the French advance threatening the vital Laon—La Fère line be halted.

On Sept 14 Mangin gained a footing on Mt. des Singes on the Ailette, took Allemont and Sancy, and reached the edge of Vailly on the Aisne. Von Carlwitz's desperate counterattacks could not halt the movement, and next day the French took the plateau east of Vauxaillon, improved their positions along the Sancy-Selles line, took Mt. des Singes, Nanteuil-la-Fosse, Laffaux Mill and Vailly, thus gaining a strong line from the Aisne across to the Ailette. During the day they took 3,500 prisoners and repelled repeated counterattacks. Attacked along this front on Sept. 17, they repelled the attacks and advanced next day south and east of Anizy and beyond and from Coucy toward the St. Gobain Forest.

The Crown Prince's troops along the Vesle had already commenced their preparations for a withdrawal, which began on Sept. 4. Mangin's advance between the Oise and the Aisne compelled the enemy to withdraw, followed to the Aisne by the American divisions, which occupied Giennes and Villers-en-Prayères. From Fismes eastward the German line on the Vesle held for a longer time.

Germans Defeated in the Somme Area. — While the German withdrawals in the Somme area were in progress, General von Boehm, the German retreat expert who had been put in command, concentrated a very heavy force before Douai and Cambrai in their old 1917 lines. Instead of using his forces to push the retreating foe, Marshal Foch struck through at the bases on which the enemy was withdrawing. General Horne's First British Army, striking east from before Arras late in August had been able to make but little headway against determined opposition.

On Sept. 2 a picked force, mostly Canadians, advanced behind an enormous fleet of tanks along both sides of the Arras-Cambrai road, drove squarely through the famous Drocourt-Quéant switch line in spite of determined resistance by a German force of some 10 divisions concentrated on eight miles of front and aided by all the devices developed in the old system of trench warfare in positions prepared and held for more than two years. It was one of the most remarkable feats of arms of the war. The German losses were heavy, including 10,000 prisoners. The British had advanced about five miles, and as the enemy was in no position to counterattack, the advance continued next day to the line L'Ecluse-Rumaucourt - Baralle - Beaumetz-Ypres. On Sept. 4 the British advanced from Inchy, crossing the Hirondelle and taking Mœuvres, thus approaching Cambrai within seven miles from the west. Thence the advance continued, keeping touch to the southwest with the movement from Bapaume, until heavy German reserves appeared around Cambrai. The British point of attack then shifted to the south around Péronne, where, crossing the Somme on Sept. 5, they advanced in conjunction with the French on their right, bringing their own line abreast of the recent gains before Cambrai, capturing hill positions and villages around Nurlu on Sept. 6 and next day the railroad junction at Roisel and most of Havrincourt Wood. After a few days of bad weather the British resumed the attack, taking Holnon Wood before St. Quentin on Sept. 12, and, to the northeast of Bapaume, Trescault and Harricourt with 1,500 prisoners, and Bertincourt and Jeancourt next day. The enemy retained his concentration before Cambrai and made frequent attacks, especially around Mœuvres, where he gained all but the western edge only to be driven out entirely on Sept. 20.

The Third and Fourth British Armies, attacking on a 16-mile front from Holnon to Gouzeaucourt on Sept. 18, took over a dozen villages and advanced on the right and center to the old 1917 lines. Next day they reached the outposts of the fortified enemy positions from Pontru north to a point opposite Gouzeaucourt and brought their captures up to 8,000 men and 50 guns. They were aided in these operations by the American 27th and 30th Divisions. On their right the French advanced between Holnon and Essigny, taking Contescourt on the 19th and Essigny the 20th, and reaching the Oise at Vendeuil, where Fort Vendeuil was taken on the 22d.

Germans Withdraw along Lys.— Meanwhile, to the north, the Germans began a gradual withdrawal from the Lys salient west of Armentières, the scene of their April offensive in Flanders. The British pushed on their heels, occupying Bailleul on Aug. 30 and Mt. Kemmel next day, followed rapidly by Neuve Eglise, Wulverghem, Richebourg-St. Vaast and Nieppe. They took Ploegsteert on Sept. 5, a series of local engagements and counterattacks indicating that while the Germans could not hold all the ground they had taken they would not give it up unless driven out.

The French, south of St. Quentin, after taking Guiscard, began a series of movements on La Fère, Generals Humbert and Debeney operating north of the Somme and between the Somme and the Oise, while Mangin's advance up the Oise threatened from the south. North of the Somme they took St. Simon on Sept. 7 and, coöperating with the advance further south, pushed the enemy back between the Grozal Canal and the Oise to approximately the 1917 line between La Fère and St. Quentin.

Between the Somme and the Oise their advance gained Ham and Chauny and the front between on Sept. 7. Next day they advanced through Genlis Wood and occupied Tergnier against moderate resistance. The enemy made a determined stand at Mennessis and temporarily regained the town on Sept. 8, only to be swept back to within three miles of La Fère. Operations now relaxed, probably awaiting the American advance at St. Mihiel.

Americans Wipe out St. Mihiel Salient.—As a preliminary to a contemplated advance down the Meuse, Marshal Foch directed the elimination of the St. Mihiel salient. The American divisions were largely withdrawn from the Allied armies with which they had been serving. The American First Army was organized on Aug. 10, and on Aug. 30 the front from Port-sur-Seille west through St. Mihiel and thence north to opposite Verdun was placed under General Pershing's command. For the time being he retained direct command of the First Army. The American forces were now to be entrusted with their first independent major operations. (See also XI, *The Army*.)

An artillery preparation of great intensity began at 1 a.m. on Sept. 12 and at 5 a.m. the seven divisions in the front line advanced, preceded by a limited number of French and American tanks and men armed with wire-cutting torpedoes and tools. From the southern face the attack on a 10-mile front was to advance northward over the Woevre plain, cross the woods at Thiaucourt and Pannes and thence northwestward to Vigneulles, while the attack on the western face advanced from Combres along the eastern edge of the Meuse heights to meet the forces from the south northwest of Vigneulles. The positions along the southern face were naturally weaker, but held in greater strength by the enemy and our troops here had a longer advance ahead of them. The more open and level ground facilitated the use of tanks, and the enemy front-line positions were soon taken. Pressing the attack, the Americans were by noon through the enemy positions and had advanced through Lahayville, St. Baussant, and Mortmore Wood. By nightfall they reached the line Essey-Thiaucourt - Villers-sous-Preny, and advancing in the early darkness, established a junction with the force from the west face at Hendicourt. At 3 next morning they reached Vigneulles, where the western force was already in possession of part of the town, thus cutting off the enemy forces between Vigneulles and St. Mihiel from their main body.

On the western face a number of French Divisions coöperated as part of the American command. The enemy put up a stiff resistance in the hill and broken ground around Combres, St. Remy, Les Eparges and Amaranthe, holding out until late in the afternoon. Once the resistance here was broken down, they pushed ahead rapidly through the Montagne forest, reaching the western edge of Vigneulles about midnight.

Completing the movement, the Americans advanced on Sept. 13 beyond Vigneulles, taking Jaulny, Gammes, St. Benoît and Hattoncourt. Counterattacks near Jaulny on Sept. 14 and St. Hilaire on Sept. 15 aided the enemy to withdraw, but some 16,000 prisoners, 443 guns, and 152 square miles of territory and 72 villages had been taken and all the ground necessary for the projected advance down the Meuse gained. The Americans unquestionably had "arrived." The American losses were 7,000, mostly slightly wounded. (See also XI, *The Army.*)

Foch Hammers the Whole Enemy line.—The Allied blows had now eliminated the threatening salients directed at Paris and Amiens and cleared the way for the advance down the Meuse. Marshal Foch was now ready to begin the pounding that was to destroy the German armies and drive them out of France and Belgium. His forces were soon in action along a 120-mile front from Flanders to the Meuse, the five main attacks falling: (1) north and east of Ypres, where the Belgians and British advanced on Roulers and Menin; (2) north of the Aisne, where the French threatened the flank of the Chemin des Dames; (3) between the Aisne and the Vesle; (4) in Champagne, the Argonne and down the Meuse; (5) and finally against the St. Quentin-Cambrai sector of the Hindenburg Line. In the face of these attacks the enemy could not shift reserves as his interior lines had so long allowed. His forces were held in their positions, and the advance north of the Oise was continued, breaking the Hindenburg Line, forcing the enemy from the positions where he had doubtless hoped to winter, while a favorable line of advance was opened for the Allies northeastward between the Sambre and the Scheldt.

The Champagne-Meuse Offensive, First Phase.—The attack in Champagne and along the Meuse opened first, the First American Army and the French Fourth Army attacking on Sept. 26. The day after the capture of the St. Mihiel salient General Pershing had his army and corps artillery and reserve divisions on the march for the area behind the front between the Meuse and the western edge of the Argonne. Here the old German line was intact to east of Rheims. The objective of the advance down the Meuse was the vital German line of communication, the railroad from Metz through Sedan and Mézières to Lille. Foreseeing such an attempt, the enemy had constructed behind his old lines new and highly fortified lines, known as the Volkar Stellung, the Kreimhilde Stellung and the Freya Stellung, to protect this essential sector. While the morale of the enemy's troops was somewhat lowered, there was no demoralization. Realizing that it was essential to stop the advance here, the Germans sent in many of their best remaining divisions, and these and the machine-gun troops displayed great courage and skill.

The American right flank was protected by the Meuse; the left flank in the Argonne faced a succession of hills, ravines, and dense woods and tangled thickets interlaced with wire entanglements and cunningly defended with all the devices four years of warfare had taught the German. On the night of Sept. 25th the Americans occupied the lines (see also XI, *The Army*), relieving the French who had held them thinly, the sector having been long inactive. The attack next morning "drove through the barbed-wire entanglements and the sea of shell craters across No Man's Land, mastering all the first-line defenses." Troops from Pennsylvania, Kansas and Missouri advanced seven miles, storming the towns of Varennes, Cheppy and Vauquois, occupied in part by Prussian Guard troops. To the east, Malancourt, Bettincourt and Montfauçon with its dominating hill were taken next day, and the advance continued, counterattacks being repulsed northeast of Varennes and along the Aire. Exermont, Gercourt, Cuisy, Septsarges, Ivoiry, Epinonville, Charpentry, Véry and other villages were taken. East of the Meuse the Americans took Marcheville and Rieville, further protecting the right flank of the main advance.

The American attack followed their taking over of the sector so promptly that the enemy was taken by surprise. Utilizing the abundant roads and railroads, he now poured in reserves and began to counterattack incessantly, bombarding heavily and using many gas shells. In the face of much opposition the Americans were occupied from Sept. 28 to Oct. 4 in clearing snipers and continuous lines of machine guns from scattered patches of woodland, moving forward their lines and getting up guns and transport, and seizing essential points for the second phase of the advance. The engineers spent the nights building and repairing roads and bridges, usually in cold and rain. The First Army had taken 10,000 prisoners and gained favorable positions after pushing ahead seven miles through the Hindenburg and Volker Stellung lines. On the left the enemy retained his hold in the Argonne.

West of the Argonne the French advanced only slightly the first day, but reached the German second line behind the Py. After renewed artillery preparation next day, the heights north of Fontaine-en-Duesmois were carried and Somme-Py taken. The American 2d and 36th Divisions were operating with Gouraud's Fourth Army, and at Somme-Py broke through the German line for a gain of six kilometres, leading all other divisions in the attack. Gouraud advanced steadily on the 29th and 30th and Oct 1 and 2, when he took Challerange and a front of some miles to the west, having captured some 14,000 prisoners, while the 2d Division again distinguished itself west of Challerange. These gains advanced the French lines within four miles of Vouziers and the German railway line running west and supplying the front toward Rheims.

Loivre was taken on Oct. 3d and the enemy began an enforced withdrawal from the area between Rheims and the Aisne. By evening of Oct 4 the Aisne line had been taken east to the canal at Berry-au-Bac, also the Brimont forts, Nogent-l'Abbesse and the heights around Moronvillers. The French advanced east into the angle between the Suippes and the Aisne, crossing the Suippes at numerous places and the Aisne from Belherniville to St. Pierre, and advanced two miles north of the Aisne on Oct. 8. Aided on the west by Mangin's advance on Laon and on the east by the Americans, Gouraud pushed northeast up the Aisne taking Neufchâtel, Asfeld and Château-Porcien. Vouziers, to the east, was taken on Oct. 12, and by Oct. 16 Gouraud was attacking around Rethel.

The Champagne-Meuse Offensive, Second Phase.—The First Army renewed its attack all along the front on Oct. 4, the Third Corps advancing on the Brieulles-Cunel road, the Fifth Corps taking Gesnes, while the First Corps, following the winding Aire valley, advanced two miles through the cleverly fortified wooded hills of the Argonne. The enemy put up a determined fight, backed by constantly arriving reserves, as it was essential that the advance down the Meuse be halted. The American replacement troops were put into the divisions to replace the casualties incurred in the heavy fighting, and though not fully trained, soon fought like veterans.

The First Corps took Châtel-Chéhéry on Oct. 7 against determined opposition, and advancing along the Aire next day, Cornay, four miles southeast of Grand Pré, the immediate American objective. Americans advanced down the right bank of the Meuse, northeast of Verdun, taking Haumont Wood, Beaumont, Brabant and Consenvoye. The advance aided the operations on the west bank, but was not pressed.

The Fifth Corps took Fléville on Oct. 9 and the Third Corps advanced after prolonged fighting through Brieulles and Cunel. The Argonne had been cleared, but along the western edge, around Autry and Lancon, a determined defense checked the advance on Grand Pré in spite of the French and American advance from Somme-Py and the capture of Mont Blanc and the Challerange positions by the 2d Division. On the east the advance continued, and in gallant attacks on Oct. 14 the First Corps took St. Juvin and the Fifth Corps gained a foothold on the Kriemhilde Stellung, designed and expected by the enemy to halt the Americans. On the 16th the Fifth Corps penetrated these positions more deeply, and the First Corps took Champignuelles and the important town of Grand Pré, commanding the east-and-west and north-and-south roads through the Argonne.

The enemy's positions had been carefully prepared and stoutly defended, and the fighting in the woods was of the most desperate character, one position changing hands three times. The capture of the Grand Pré gap allowed the reduction of the small remaining section of the forest and preparation for the third phase of the offensive. The First Army had driven through the Kriemhilde Stellung, shattered the enemy's four-year grip on the Argonne, and was re-forming for the attack on the Freya Stellung, the enemy's last line, south of Sedan, the objective of the offensive. East of the Meuse, at Caure Wood and Ormont Wood, there had been stubborn fighting; the enemy was forced back five miles in 11 days of constant struggle, the 29th Division carrying Ormont Wood in gallant style.

The Thrust for St. Quentin and Cambrai.—The day after the opening of the Champagne-Meuse offensive Marshal Foch began to develop his thrust at the St. Quentin-Cambrai front, so long the strongest sector of the Hindenburg Line. Here Horne's First British Army, Byng's Third British Army, Rawlinson's Fourth British Army, Read's American Second Corps and Debeney's First French Army, starting from the positions gained in the recent operations before St. Quentin and Cambrai, broke through with decisive results.

Byng drove forward on Sept. 27 against the positions west and southwest of Cambrai on a 12-mile front from the Arras-Cambrai road south, storming Beaucamp Ridge, advancing from Havrincourt through Marcoing on Cambrai. Other troops on the Bapaume-Cambrai road forced a passage of the Canal du Nord and took Anneux, flanking the defenders out of the fortified village of Graincourt. The Americans, further south, carried enemy positions southwest of Le Catelet. Meanwhile, to the north, Marquoin, the defensive center on the Arras-Cambrai road, was flanked by the capture of Sauchy-Couchy to the north, while the Canadians took Sains-les-Marquoin, flanking it to the south, and pushed on to Bourlon.

While the enemy vainly attempted to reëtablish his Cambrai defenses, the British struck again on the 29th, crossing the Scheldt Canal and storming the enemy's positions midway between Le Catelet and St. Quentin. Conforming with this movement, the Americans again attacked, capturing the canal tunnel positions south of Le Catelet and the villages of Bellicourt and Nauroy. Still further north the British advanced to the canal, taking positions fought over in November, 1917. Counterattacks on Sept. 30 and Oct. 1 regained some ground at the northern end of the line, but north of St. Quentin the British advanced, seizing the canal tunnel near Troucaquoy.

The French joined the movement on Sept. 29, taking Urvillers and Cerizy south of St. Quentin, and on Oct. 1 attacked from the west, taking most of the town, crossing the canal, and gaining the remainder next day in spite of bitter street and house-to-house fighting. During the day their lines to the south of the town moved forward to the Oise and St. Quentin was at last in French hands.

Renewing their attack on Cambrai, the British struck on Oct. 3 on an eight-mile front between Sequehart and the canal north of Bony, taking 4,000 prisoners, biting deep into the enemy lines and overrunning his trench lines between Beaurevoir and Fousomme. The enemy delivered persistent furious counterattacks which resulted in only temporary delays. On Oct. 5 he was compelled to withdraw from the heights northeast of Le Catelet, but kept up his counterattacks around Beaurevoir and Montbrehain next day, probably to permit withdrawal of troops and supplies from Cambrai. North of Le Catelet the British took Aubencheul and positions around Lesdain. The fighting went on without pause.

On Oct. 8 Brig.-Gen. E. M. Lewis, with the American 30th Division, cut deeply into the line east of Le Catelet, taking Brancourt and Prémont. British troops took Serain, Walencourt and the trenches west. The New Zealanders took Lesdain and Esnes, while the French from St. Quentin took Rouvroy and Fontaine-Uterte and began forcing the enemy out of Harly and Neuville-St. Amand to the Oise.

On the north the Canadians took Ramillies and the canal crossings northeast of Cambrai, which was becoming untenable. On the night of Oct. 9 the British entered the city, the week's fighting having resulted in the capture of 30,000 prisoners and the taking of the enemy's positions from Cambrai to St. Quentin, tearing a gap through which the Allies pushed ahead some 15 miles in five days, undermining the enemy's lines to right and left. This breaking of the Hindenburg Line, aided as it was by the offensives elsewhere, was one of the decisive engagements of the war.

The Offensive in Flanders.—The Belgian Army and General Plumer's Second British army, later aided by French divisions and the 37th and 91st American divisions transferred from the Meuse, operating under command of King Albert, attacked on Sept. 28, the Belgian attack falling on an eight-mile front from Dixmude to north of Ypres, advancing some three miles, with the capture of Poelcapelle, Houtholst Wood, Passchendaele Ridge and 4,000 prisoners. Repulsing counterattacks, they advanced next day to within four miles of Roulers.

Attacking east of Ypres, General Plumer took the Messines-Wytschaete Ridge and advanced to the Lys, where next day he occupied a five-mile front from Warneton to Werwick, while the Belgians and French took Stadensett and advanced across the Roulers-Menin road. Next day the British crossed the Lys and advanced toward Roulers, while the Belgians approached within 2½ miles. On Oct. 3 British, French and Belgians were drawing in on Roulers from north, south and west, and the Germans began destroying material prior to evacuation. South of Ypres the enemy, because of the difficult situation north and south, began withdrawing on Oct. 2 from around La Bassée toward Lille and from Armentières and Lens. British attacks between Lens and the Scarpe to impede this withdrawal yielded several villages on the route toward Douai.

Attacking on Oct. 14 on a 12-mile front from the Handzeme Canal to the Menin road, the Allies took Cortemarck and Roulers, and continuing the advance on the 16th and 17th, took Werwick, Menin and Courtrai. British troops advancing from the southwest entered Lille on Oct. 16, the Germans having removed their supplies and abandoned the place without destroying it. These withdrawals forced a withdrawal from Ostend. King Albert, Queen Elizabeth, and British naval forces entered the town on Oct. 17. Douai was entered Oct. 17 and Tourcoing and Roubaix next day, the enemy withdrawing behind the Scheldt, where he delayed the British advance around Tournai. Eastward from Douai the advance was rapid until it approached Denain, where the resistance stiffened lest the Raismes Forest to the north and the Selle to the south, important defenses of Valenciennes, be flanked.

The German withdrawal, carefully planned and organized, continued. Bruges and Zeebrugge, the submarine base, were abandoned, the enemy withdrawing behind the Lys from the border of Holland toward Courtrai on Oct. 20. The Belgians and French pursued, taking Thielt, advancing on Ghent and coöperating with the British advance on Valenciennes. The Belgians advanced to the canal north from Ghent to the border on Nov. 2 and attacked Ghent. To the south the French, with the 37th and 91st American Divisions, having captured Denyse on Oct. 31, cleared the angle between the Lys and Scheldt, the 91st Division capturing Spitaals Bosschen Wood, while the 37th forced the enemy across the Scheldt and crossed the Scheldt near Audenarde on Nov. 8 and 9. They were forcing the enemy rapidly back on Brussels when the armistice ended the advance.

Heavy fighting on Oct. 23 and 24 advanced the British lines toward Valenciennes, the enemy cutting the canals northeast of the city, flooding a large area and forcing the attack to shift to the south while the enemy was driven out of villages west of the Scheldt. On Oct. 25 Horne and Byng had reached the Valenciennes-Le Quesnoy railway. Here repeated counterattacks were repulsed, forcing the enemy to fall back behind the Rhondelle. North of the city the Forest of Raismes and the Scheldt, and south the huge Forest of Mormal, proved strong obstacles to the advance. Pressure was maintained to the north, while the attack proceeded from the south. On Nov. 1 British and Canadians took Preseau and Aulnoy, and Marly and St. Saulre next day, while the Canadians entered Valenciennes, abandoned by the enemy, who was pressed eastward.

To the south the First, Third and Fourth British Armies and the Second American Corps advanced between Valenciennes and the Sambre Canal, capturing Landrecies and Catillon on Nov. 4. Advancing through Mormal Forest next day, they pushed ahead, taking Quievrain and Crespin on Nov. 7 and forcing a passage of the Mons-Condé Canal next day. These gains forced the troops behind the Scheldt at Tournai, thus outflanked, to fall back. The Second and Fifth British Armies crossed the Scheldt in pursuit on Nov. 9, advancing on Mons, which they entered on Nov. 11, a few hours before the armistice became effective.

The First, Third and Fourth Armies advanced down the Sambre, taking Dompierre and Monceau-St. Vaast on Nov. 7, Houmont and Avesnes next day, and Maubeuge on Nov. 9. The hour of the armistice found them along the Belgian border south of the Sambre.

French Advance on the Aisne-Oise Front.—North and south of the Aisne the armies of Mangin and Berthelot moved forward in coöperation with the remainder of the Allied line. North of the Aisne, Mangin continued his thrusts along the Oise into the St. Gobain hills, and taking Fort Malmaison on Sept. 28, pushed up to the Ailette, having previously occupied Jouy and Aizy. Next day he cleared the Pinon forest, took Pargny and Filain, and advanced north to the Ailette. Italian troops took Soupir by storm on Sept. 30.

Gains around St. Quentin and the crossing of the Aisne at Berry-au-Bac by other troops forced the enemy to withdraw on Mangin's front. French and Italian troops developed the fact that the line of the Oise-Aisne Canal was feebly held and pushed east, occupying the entire Chemin des Dames ridge on Oct. 11 and 12. Reconnaissance of the woods on the St. Gobain Massif found them no longer occupied, and the French occupied La Fère and Laon on Oct. 13 without opposition. The pivot of the old German line in France was smashed.

South of the Aisne, Berthelot attacked between the Vesle and Aisne on Sept. 30 with some success, taking Revilloi, Romain, Montigny, Meurival and the St. Thierry plateau and 3,600 prisoners. These movements, and those of General Gouraud north of Rheims, threatened their Ailette line, and the enemy began falling back on Oct. 1, pressed by the French, who took 2,000 additional prisoners and forced the enemy back to the Aisne.

Advancing from the La Fère-St. Quentin positions, Debeney's First French Army advanced along the Oise, aiding the British advance around Le Cateau, assaulting and capturing the highly organized Forest of Andigny and the adjacent villages commanding the bend in the river above Guise. East of La Fère the French, having cleared the angle between the Oise and the Serre, pushed slowly forward in small but ceaseless encounters. On Oct. 19 they advanced on the east bank beyond Ribemont and pushed eastward along the north bank of the Serre. Further east French and Italian troops assaulted a two-fold trench system south of the Serre and the Souche eastward some miles to the Sissone marshes. Carrying these positions, they advanced to the south bank of the upper Serre, and crossing the Souche at Brazicourt, advanced on Froidmont. In the Oise-Serre angle they advanced on Feronelle.

Continuing the advance north and south of the Oise bend, Debeney's troops forced a withdrawal on a 15-mile front to a depth of five miles on Oct. 24. The enemy held out stubbornly in Guise while their troops south and east retired. Repeated counterattacks on Oct. 24 and 25 allowed them to keep their hold on the town until Nov. 3. An attack north of Guise that day crossed the Sambre-Oise Canal on a seven-mile front by numerous bridges in face of heavy machine-gun fire and advanced the line to Nouvion Forest.

To the east Mangin's troops, keeping up a constant pressure and advancing by continuous small attacks, reached the north bank of the Serre on Oct. 25, gaining along a front eastward to the Aisne at Château Porcien. These gains continued, the Aisne being crossed on Nov. 5 at points between Rethel and Attigny.

Pushing ahead rapidly on a front of some 40 miles between the British on their left and the American First

Army on their right, the French made great progress after their difficult fighting between the Oise and the Aisne. Marle was taken on Nov. 3, and the attack shoved ahead through Nouvion and Rynaval Forests on Nov. 6 and 7, advancing on Hirson. Crossing the La Capelle-Hirson railroad, they approached Hirson from the west. Trelon, Fourmies and Hirson were taken on Nov. 9 and the French advanced to the Belgian border, seizing trainloads of German material. The Italians entered Rocroi on Nov. 11. To the east the French crossed the Thon between Origny and Liart on Nov. 8 and advanced practically unopposed next day across the Hirson-Mezières railway. Between the Aisne and Meuse Gouraud's army advanced unopposed on Nov. 7 and 8, racing the American divisions on their right to reach Sedan. He struck the Meuse from Sedan to Mezières, and, crossing without hesitation, surrounded Mezières.

The Meuse-Argonne Offensive, Final Phase.—After taking Vouziers the French struck east at the portion of the Argonne north of Grand Pré, taking Vandy and villages and heights east of Vouziers, which they held in spite of repeated heavy counterattacks extending over several days. The American Third and Fifth Corps advanced up the left bank of the Meuse by stubborn fighting, taking Bantheville on Oct. 18 by a sudden thrust without artillery preparation, and Hill 297 and Bois de Rappes on Oct. 21, while on the 23d they occupied Brieulles. Around Grand Pré the enemy attacked in determined fashion to regain his positions, but after minor successes was entirely ejected on Oct. 23. East of the Meuse local attacks carried Hill 360 on Oct. 25, and after resisting counterattacks throughout several days, the Americans retained Belleau Woods to the north and repulsed counterattacks in Ormont Wood.

Repulsing counterattacks near Bantheville, the Third Corps took Aincreville, Doulcon and Andevanne on Oct. 29, while the Fifth Corps took Landres-et-St. Georges and pushed through the enemy's lines to Bayonville and Chennery. Attacking on Nov. 1 between Champigneulles and Andevanne, they next day captured Buzancy after hard fighting, the First Corps joining up with the advance, which the enemy was unable to halt. Four thousand prisoners were taken and the enemy retired rapidly, pursued by infantry transported in trucks, while the artillery pressed along the country roads close behind. On the left they joined the French from Vouziers at Noirval, squeezing the last of the enemy out of the Argonne. The First Corps reached Authe and Chatillon-sur-Bar, the 42d Division taking Hill 288, declared to be impregnable. The Fifth Corps took Fosse and Nouart, and the Third Halles. The enemy's lines had been penetrated to a depth of 12 miles.

The Third Corps reached the Meuse opposite Pouilly and forced a passage on Nov. 5, establishing a bridgehead in the bend of the stream. Between Dun and Brieulles one of its brigades forced a passage on Nov. 4 in spectacular fashion. The crossing secured and men brought up, the brigade thrust forward on Nov. 6, taking Dun, Milly, Liny and Lion and adjacent villages and consolidating the position.

The enemy had no stomach for fighting such as he was being called on to face and began withdrawing to the east bank of the Meuse from Stenay to Mezières. On the left French cavalry pursued, moving toward the river between Mezières and Sedan, while the Americans pushed ahead for Sedan. A division of the First Corps reached the river opposite Sedan on Nov. 6 and entered the town next day, while troops from Gouraud's army also entered the western part of the town.

East of the Meuse other troops of the First Army advanced to the Ecuray Wood on Nov. 8, reached Montmédy next day, crossed the river near Mouzay, and entered Stenay on Nov. 10. The 26th Division took Damvillers.

The First Army had reached its objectives after advancing 25 miles through all the enemy's highly fortified defensive lines against 40 enemy divisions, including the best in the German Army. They had captured 26,059 prisoners and 468 guns. Twenty-one American divisions, more than 1,000,000 men, took part in the engagements, eight of them being sent in twice. The enemy's great east-and-west line of communication had been cut at Sedan, and only surrender or an armistice could save his army from complete disaster.

The Second American Field Army.—On Oct. 9 the immediate command of the First American Army was turned over to Lieut.-Gen. Hunter Liggett and a Second Field Army was formed in the Woevre, commanded by Lieut.-Gen. R. L. Bullard (see also XI, *The Army*). On Nov. 10 the recently organized Second Army, on the front Manheuilles to Port-sur Seille, attacked strong German positions in the Woevre area between Verdun and Metz, carrying villages and woods on an extended front and advancing on Metz when the armistice ended operations.

THE ITALIAN FRONT

Winter Operations. — During the first half of the year there were few actions of importance on the Italian front. In the Mount Asolone region the Italians attacked on Jan. 14 from north of Osteria to Cesilla valley, taking front-line positions and prisoners after a period of air and artillery activity. They gained near Fontana Secca next day, while on Jan. 23 French pressure around Mt. Tomba forced withdrawals. Italian attacks on a six-mile front from the Brenta to the Asiago plateau on Jan. 26 and 29 took 2,600 prisoners and Col del Rosso and Valbella heights. These gains recovered ground lost in December, at the northern end of the Frenzela gorge. Austrian efforts to recover the positions were repulsed on Jan. 31 by artillery fire, and the Italians advanced to the head of the Melago valley. Strong attacks east and west of the Frenzela on Feb. 10 failed, and were again repulsed next day, as were attempts to cross the lower Piave and to advance on Feb. 12 at Col Capuli.

Austrian Offensive against the Piave Line.—The long expected Austrian offensive began on June 15 on a front from the Asiago to the Adriatic. Along this 90-mile front the principal attacks were made in the Brenta sector on the mountain front, the Montello, Candelu and Zenson sectors on the Piave, and on the coast near the mouth of the Piave. On the Brenta the Italian third line was penetrated and 6,000 prisoners, including French and British, were taken. Counterattacks drove the enemy from Mt. Robero, but west of Mt. Grappa they retained captured positions. Successful local attacks by the Allies then brought the enemy to a halt and put him on the defensive. Along the middle Piave the Austrians forced a crossing near Montello but determined British opposition prevented their capture of the ridge west of the stream and halted the advance on the 17th. At Nervesa and Candelu the attack was not so determined, the Austrians after crossing being held close to the stream. At Zenson the attack was pushed with great vigor, and after crossing advanced southward to Fossalta. Near the mouth of the Piave General von Wurm's troops advanced to Capo Sile on June 16, while north of the Sile troops advanced west from Santa Dona.

The Austrians claimed the capture of 30,000 men and 120 guns, while the Italians reported the capture of 9,000 Austrians. They had halted an offensive quite similar in plan to the one so costly to them in the preceding October. Heavy rainfall now came to their aid, bringing a suspension of operations while the Piave rose rapidly, carrying away Austrian bridges and leaving troops on the western bank separated from reinforcements and supplies. Their situation was most serious at the crossings highest upstream, where they had gained only narrow footholds, and the Italians attacked furiously. General Diaz began a constantly increasing pressure of men and guns, and the Austrians withdrew across the river on the night of June 22 at all points of their June 15 advance except the Mt. Grappa and Asiago positions and along the Sile from Santa Dona to Capo Sile. Heavy losses of men and material were inflicted and 4,000 prisoners taken during the withdrawal.

The Italians attacked on June 24 and 25, forcing the enemy back at Santa Dona and reoccupying the Capo Sile bridgehead, while in the north they advanced south of Asiago and around Mts. Solarolo, Pertica, and Col del Rosso, capturing 18,000 Austrians. Their cavalry crossed the Piave on June 24 and carried out local reconnaissances, but the advance was not followed up. Allied forces captured Mt. di Valbella on June 29 and Col del Rosso and Mt. Echele after bitter fighting next day. Further gains around Mt. Grappa were made on July 2. The Italians now applied additional pressure around the mouth of the Piave, forcing the Austrians across the river on July 6 out of positions held since November, 1917, the Italians fortifying the western bank, while the Austrians retained a small position in the delta near Grisolera.

General von Hoetzendorf was replaced, as a consequence of the Austrian failure by General von Below, leader of the Isonzo offensive of October, 1917, and recently commanding German troops in the Bapaume sector.

Italian Offensive Along the Piave.—By October the situation on the Western Front was such that Marshal Foch directed an Italian offensive. The operation, directed at the upper Piave, contemplated a crossing there, driving the enemy eastward and allowing a rapid advance on Udine, thus cutting in two the Austrian forces and hemming in those to the south between the attacking army and the sea. Attacks along the lower Piave were to hold in place the troops it was planned to outflank and prevent sending of aid to the principal theatre of attack.

Heavy local attacks east and west of the Brenta on Oct. 24 made substantial gains. Austrian reserves came up but counterattacks failed to regain the lost positions. The main attack began on the night of Oct. 26-27. Furthest upstream the Italian Twelfth Army forced a crossing near Valdobbiadene, cleared the hills, and advanced on Follina. The Eighth Army crossed near Susegana and advanced on Conegliano, its left flank covered by the Twelfth Army. Gen. Lord Cavan's Tenth British Army crossed near Grave di Papadopolo, having previously taken the islands in the stream. Here the Austrians fought stubbornly for two days, holding up the British advance on Oderzo, but losing 9,000 prisoners.

The Eighth Army advanced five miles on the 29th, taking Conegliano, the Austrians taking up positions behind the Monticano. This advance aided the British on the right of the Eighth Army, and next day both armies advanced on a front from Vittorio to Oderzo, keeping touch with the Twelfth Army on the left. The Austrians could not halt these concerted attacks, and the Allied armies advanced rapidly, reaching the Livenza on Oct. 31 on a wide front, having taken Vittorio, Sacile and Oderzo. In the face of such progress the Austrians on Oct. 31 asked for an armistice, but the request had come too late to avoid disclosing the utter collapse of the Austrian forces.

On the lower Piave the Duke of Aosta's Third Italian Army made crossings and established bridgeheads, holding the Austrians in their positions. The secondary attack at the north continued meanwhile to gain in the Trentino and the Asiago. The Fourth Italian Army advanced east of the Brenta and up the valley of the Cismone, breaking Austrian resistance and, pursuing through the mountains, reached the Susegana valley on Nov. 2. The Sixth Army advanced on the upper Brenta, capturing positions in the Asiago. The enemy in the Trentino held his positions until Nov. 1, but was then forced back, the Italians taking Roverto on Nov. 2 and Trent two days later, with quantities of prisoners, guns and stores.

The Austrian Surrender.—Driven across the Livenza on Nov. 1, the Austrian retreat became virtually a rout. The pursuit crossed the Tagliamento on Nov. 2 near Spitimbergo so close on the heels of the retreating Austrians as to give them no opportunity to make a stand behind that stream. The Italians pressed on and occupied Udine, their headquarters in 1917. The Twelfth Army continued its advance up the Piave valley, taking Belluno with men, guns and stores. The state of the Austrian forces was now hopeless. Those on the lower Piave were penned between the sea and the victorious Italian and British armies, while on the upper Piave and in the Trentino they had been forced back off their lines of retreat and into the mountains, making further retreat almost impossible. The Allies had taken 300,000 prisoners and 5,000 guns. Caporetto and the dark days of October, 1917, were handsomely avenged, and on Nov. 3 an armistice was signed by which Austria, following the example of Bulgaria and Turkey, ceased to be a belligerent under similar but more drastic terms than had been exacted of either Bulgaria or Turkey (see II, *International Relations*).

THE BALKAN FRONT

Allied Offensive in Albania.—The enemy front in Macedonia was held almost entirely by Bulgarian troops, and in Albania by Austrian. The Greeks had continued raising and training a large army. Both sides seemed content to remain quiet, and up to July, except for artillery actions and French, British, and Greek raids, there was little activity.

Taking advantage of the difficulties of the Austrians after the failure of their offensive in Italy in June, the Allies began a series of attacks in Albania. French troops took Mt. Gjasperit, while the Italians took Fieri, north of their base at Avlona, and also advanced down the Voyusa valley, capturing Berat on July 11 and forcing the Austrians back behind the Semini, while the French advanced down the Divoli to the Tomarica. The Italians advanced and took the high ground in the bend of the Divoli south of Elbasan, while small attacks in the valleys of the Struma and Vardar occupied the enemy's attention. These gains secured Avlona against attack and weakened the enemy's positions around Lake Ochrida and Monastir.

Allied Offensive Frees Albania and Serbia.—When the German advance in June threatened Paris, General Guillaumat, commander-in-chief of the Allied Army of the Orient, was recalled to take command of the defenses of Paris. He had been organizing and training the Greek Army, and had prepared plans of a campaign to recover Serbia and crush the Bulgar armies. These plans were now put in execution by his successor, General d'Esperey.

The plan called for a principal operation in the nature of a "break through" in the region of Kavadar and the confluence of the Cerna and Vardar Rivers. It included three phases, first a breach in the sector Sokol-Dobropolie-Vetrenik, next the capture of the region around Koziak, and finally the enlargement of this breach and a separation of the Bulgar forces, pushing part east and part west; as a secondary operation, a break through in the Vardar valley and Lake Doiran region; and finally, an exploitation all along the front from the region of the lakes to the Struma.

After a number of minor operations all along the front, the main operation was begun on Sept. 15, when the Serbs attacked on a front from Mt. Dobrapolie to Mt. Vitrenik, breaking the lines of General Nerevoff's First Bulgar Army on an 11-mile front in spite of bitter counterattacks with heavy reserves. Koziak was taken next day and the gains enlarged west to include Mt. Sokol and fortified points between Sokol and Gradeshnitza, and eastward the entire front line to include Zborsko. On the 17th Mt. Gyurov Kamen, near the center, was taken, with gains west to Poltchichsta and Zovik and east toward Preslap.

The separation of General von Steuben's so-called Eleventh German Army and the First Bulgar Army in the Cerna valley from General Lukoff's Second Bulgar Army on the Vardar was begun, and General d'Esperey judged his advance warranted beginning the second step. Accordingly, British and Greek forces attacked on either side of Lake Doiran. West, the enemy lines were broken but largely reëstablished by counterattacks. East, the line held fast. However, the front between the Cerna and Bochava was broken, and on the evening of the 17th French and Serb troops had reached the line Selo-Monastir-Verbsko-Klinovo-Blatetz, while Serbian cavalry was operating around Polosko to the north.

Exploiting the gains made, the Allies struck for the centers of communication, Gradsko, Veles and Uskub, and to force the now separated Bulgar forces further apart. French and Serb troops crossed the Cerna on Sept. 20 and reached the Vardar next day after severe fighting, cutting the railroad and capturing much material. They reached the north of the Cerna on Sept. 22, cutting the military railway to Prilep, thus cutting off the First and Second Bulgar Armies from their bases of supply and forcing their more rapid withdrawal. The front from Monastir to the Vardar was advanced, Gradsko, with enormous supplies, taken, and bridgeheads established across the Vardar at Gradsko and Krivolak. East of the Vardar the Bulgar withdrawal allowed the British and Greek forces to advance, conforming with the Allied lines across the river. By the 23d the Bulgar retreat was becoming increasingly disorganized, men throwing away arms and entire military trains and convoys being captured. The Vardar was crossed in force next day and the right bank from Gradsko to Lake Doiran occupied.

On the Serbian left French and Greek troops advancing northward from Monastir took Prilip on Sept. 25, while on the right the British and Greeks crossed the Bulgarian frontier and took Strumnitza. The Bulgars began withdrawing between the lakes. A German cavalry force in Veles (Koprula) held out, but the road between Prilep and Veles was cut. Kruchevo was taken on Sept. 25 and Veles next day, and Resna occupied.

Bulgars Surrender. — The advance north continued, part of the Serb force marching on Uskub and Kumanova and part on Sofia. On the Presba-Brod front they had by Sept. 28 about reached the last line of retreat from Kruchevo to Gostivar. To the east other groups advanced toward the upper Struma and the Bulgarian border, while the French and Serb cavalry operating from Gradsko met little opposition and moved freely in all directions. French cavalry captured Uskub on Sept. 29, thus cutting off the retreat of the First Bulgar Army in the mountains to the southwest.

The Bulgars, already war-weary and seeing the impending collapse of the Teutonic powers, who could no longer extend any aid, were ready to quit, while the skilful operations of General d'Esperey left them little choice. In two weeks he had broken through their strong mountain positions, fortified and held through three years, had taken the Vardar valley northward to Uskub, separated the Bulgar forces, cutting off the retreat of the western portion, while interposing his now superior force between General von Sholtz's defeated armies and their capital. The Bulgar Government requested a truce on Sept. 26, and being referred to General d'Esperey, were granted an armistice, the terms of which constituted virtually an unconditional surrender (see II, *International Relations*). Fighting ceased at noon on Sept. 30.

Teutons Driven out of Albania and Serbia.—The Bulgar collapse left the Teutonic forces in Serbia and Albania so exposed that an immediate retreat became necessary. In a rearguard engagement at Godilice Pass on the road to Nish the Serbs cut off and captured 2,000 prisoners, mostly Germans, and took Nish after an encircling movement on Oct. 12, thus severing rail communication between Germany and Turkey. The Teutons continued a rapid withdrawal, the Serbs driving them in rearguard actions north of Nish. Cragujevatz was occupied on Oct. 27 and the Serbs crossed into Herzegovina.

An Allied naval force destroyed vessels and buildings at Durazzo on Oct. 2, and Italian troops occupied Berat without opposition, reaching Elbasan on Oct. 7 and capturing Durazzo on Oct. 14 after taking the surrounding hills by storm. They reached Alessio on Oct. 27 and advanced on Scutari. Following the Austrian surrender, on Nov. 3, the Allies jointly landed forces and occupied the country pending a final disposition at the peace conference.

THE WAR IN ASIA

After the capture of Jerusalem General Allenby moved slowly northward along the highland and the Nablus road, improving his position and restraining any movement by General Falkenhayn's force at Aleppo against General Marshall's army in Mesopotamia. Arab tribesmen of the King of the Hedjaz operating east of the

Jordan aided. Following small advances, Jericho was taken on Feb. 21, the Turks retiring east of the Jordan and the British advancing beyond Jericho and on the Nablus road. On the right of the Jordan they captured a Turkish battery and extended positions on March 22.

Troops in Mesopotamia advanced from Ramadieh and occupied Hit on March 9, the Turks falling back 21 miles to Khan-Bagdad pursued by bombing airplanes and losing 3,000 prisoners. The British advanced toward Mosul, capturing 1,800 prisoners on April 29, and passing through the semi-arid region east of the Tigris, reached Kerkuk on May 7.

East of the Jordan raiding parties cut the Hedjaz railroad and took prisoners on March 25 to April 1. The British advanced, taking Es Salt and gaining north of Jerusalem on April 30 after ineffectual German and Turk attacks on April 10 and 11 all along the front. Renewal of these attacks in May and July resulted in small British withdrawals around Es Salt and north of Jericho, which were later regained.

Russian troops in Armenia began withdrawing early in February, followed by the Turks, who took Platana on Feb. 20 and advanced, occupying Trebizond and Erzerum. Armenian forces attempted to hold out in this region, and by occupying Turkish forces aided the British in Mesopotamia. The Turks took Batum on April 16, while the Armenians recaptured Van. Turks and Kurds, advancing south of Lake Urumiah, threatened the British, who sent a column to occupy Baku, a difficult march of some 700 miles. This force was withdrawn late in the year when threatened by German and Bolshevik troops.

During the inactive hot season General Allenby held a line from the Mediterranean to the Jordan, about 15 miles north of Jerusalem, a Turkish force of about 130,000 holding the hills of Samaria in his front. A military railroad connecting Jerusalem and Cairo and a pipe-line bringing water from the Nile had been constructed. The British right faced a succession of hills intersected by deep watercourses running east and west into the Jordan or the Mediterranean and offering the enemy a succession of easily defended positions. Any advance here promised much hard fighting.

The Turks were supplied by a railroad leaving the Damascus-Haifa line at El Afule, while a second line left the first near Samaria, running west to Tel Keram and south to the front north of Jaffa. The main highway leads from Jerusalem by way of Nablus to El Afule, which was thus the key of the Turkish communications.

The Battle of Samaria.—General Allenby's plan for forcing the Turks from their hill positions and their capture or destruction was a series of limited attacks between the Nablus road and the Jordan to attract and hold their attention, followed by a heavy attack from the road to the sea, breaking through on this front and thrusting a strong cavalry force north along the coast. Such an advance would cut the Turkish communications, force their withdrawal, and afford excellent opportunities to attack them while disorganized and retreating.

The feint attack was made on Sept. 19, and next morning Australian, British and French troops attacked on a 16-mile front, the center being opposite Gilgal. After some hours of bitter fighting the Turkish line from Rafat to the coast gave way and was finally completely routed, leaving the line from the Nablus road to the Jordan holding but exposed to the turning movement along the coast. The Allied left pushed on to Tel Keram, while large cavalry columns advanced along the coast across the Plain of Sharon, part turning east toward Nablus and the Turkish rear and center, the remainder toward El Afule and Nazareth, thence eastward toward the Jordan. Thus surrounded the Turks attempted to retreat. Their German commander, Gen. Lyman von Sanders, fled, leaving the army to its fate. Unable to cut through the Allied cavalry, cut off from supplies and thoroughly disorganized, the Seventh and Eighth Turkish Armies were virtually destroyed, General Allenby's forces capturing over 75,000 prisoners and 700 guns. The Arab tribesmen of King Hussein of the Hedjaz had coöperated, cutting the Hedjaz and upper

Jordan railroads by attacks around Derat on Sept. 19, while British infantry advanced, capturing the fords of the Jordan, thus aiding in hemming in the Turks.

The Turks, Driven from Palestine, Sign Armistice.—The cavalry advanced northwest from Nazareth on Sept. 23 and occupied Haifa and Acre and the region of Lake Tiberias. General Allenby now advanced northward almost unopposed. He entered Damascus on Oct. 1, the city and 7,000 prisoners being taken by the cavalry, while French cavalry and naval forces occupied Beirut. The junction of the Palestine railroad and the line to Aleppo at Rayak was taken on Oct. 5, Tripoli on Oct. 13, Hams on Oct. 15, and Aleppo, the vital junction of the Palestine and Berlin-to-Bagdad lines, on Oct. 26. General von Sanders had gathered an army of 12,000 here, but withdrew on Allenby's approach.

The capture of Nish by the Serbs on Oct. 12 had cut rail communication between Turkey and her Teutonic allies. The capture of Aleppo now cut off the Turkish army in Mesopotamia from supplies, while on Oct. 24 General Marshall resumed his advance on Mosul. The Turks were helpless, and on Oct. 31 sent General Townshend, a prisoner of war, to the British admiral commanding in the Ægean to ask for terms. The terms offered and accepted were virtually those of an unconditional surender (see II, *International Relations*). On Nov. 9 British and French destroyers entered the Dardanelles and British troops began entering the forts around Constantinople. An Allied fleet passed through the Dardanelles, arriving off Constantinople on Nov. 13, British and Indian troops parading in the forts as the ships passed. The conclusion of an armistice with Germany ended the possibility of an engagement with the German Black Sea fleet. Turkey was fully under Allied control.

THE EASTERN FRONT

After the Brest-Litovsk armistice and conference and the virtual collapse of the Eastern Front late in 1917, the Russian Bolsheviki were engaged in conflicts with Rumania, the Ukraine, Bessarabia, the Don Cossacks, and the new Finnish republic, waging unsuccessful fights for Galatz and Lutsk and against the Finnish army at Tammerfors. The interrupted Brest-Litovsk negotiations were resumed on Jan. 7 after a ten-days recess. The Ukraine was now represented, and concluded a peace favorable to the Germans. The Bolsheviki captured Kiev, the Ukraine capital, on Feb. 8. Though they had concluded no formal peace, the Bolshevik Government now demobilized the Russian armies, stating they were no longer at war with Germany. This ended any pretense of participation in the war on the Allied side by Russia. (See also II, *International Relations.*)

Claiming the Bolsheviki had failed to accept the Brest-Litovsk terms and that their demobilization was insufficient, German and Austrian forces moved to the aid of their new allies in the Ukraine. Their armies crossed the Dvina on Feb. 18, taking Dvinsk, while another advanced from Kovel on Lutsk. A third advanced on Feb. 19 from Riga along the Riga-Petrograd railroad and the Esthonian coast. The Bolsheviki could offer no real resistance and at once proposed to accept the German terms (see II, *International Relations*), but the German advance continued. Entering Kiev on March 1, they voluntarily ceased their advance, holding a line from Kiev north through Gomal, Mogileff, Vitebsk and Pskoff to the Baltic east of Reval.

In spite of the abject acceptance of their terms and the signing of a treaty on March 3, German troops resumed the advance, entering Odessa and capturing the Black Sea Fleet and moving eastward into the Crimea. They also sent troops into Finland and occupied the Ukraine "to carry out the economic provisions of the peace treaty"—especially food shipments. The so-called republic was overthrown in May by General Skoropoadaski with German aid. This Government was in turn overthrown in November by General Denikine, a Cossack leader, on an anti-Bolshevik platform.

Rumania Signs Treaty of Peace.—A Rumanian force entered Bessarabia in February and March, but could not maintain itself against Russian and

Ukrainian opposition. Her allies could give her no assistance. After the armistice in the fall of 1917 she had refused to accept the German peace terms. She was now helpless, and on May 6 was forced to conclude a peace by which she ceded the Dobrudja as far as the Danube, paid a huge indemnity, and gave free passage to Odessa for German troops (see II, *International Relations*). Allied troops crossed the Danube on Nov. 9, easily overcoming German resistance. After the armistice the German troops under Mackensen began to withdraw, but were interned in Hungary, at the instance of France, so it was said. The Allies entered Bucharest on Nov. 17 and British troops entered Constanza in Dobrudja.

Allied Operations in Russia and Siberia.—British and French marines and soldiers landed at Murmansk and Kola on July 15 and at Archangel on Aug. 4. American troops under Col. G. E. Stewart joined the expedition at Archangel on Sept. 4. The Allies joined the local forces in defending Murmansk and Archangel and guarding large amounts of supplies landed there for the old Russian Government from falling into German hands.

The Allies, with aid of anti-Bolshevik Russians, advanced south from Archangel up the Dvina beyond its junction with the Vaga, and since late in September have withstood Bolshevik attempts to drive them back. Enemy gunboats in the Dvina have made much trouble for the Allies. A patrol of 70 Americans scouting on the Vaga south of Shenkursk Nov. 29 was attacked and surrounded by 700 Bolsheviki, but fought their way out, losing a lieutenant and 12 men killed. A Russian-American force, advancing up the Pinega River, captured Korpagorskoi, 200 miles southeast of Archangel, on Nov. 30 after a fight with Bolsheviki. This supply depot of the Allied force had been captured by Bolshevik troops.

A joint Japanese, British, French and American force was landed at Vladivostok on Aug. 4 (see II, *International Relations*), following an earlier landing by Allied naval forces. The force is commanded by General Otahi of the Japanese Army, the American contingent of about 9,000 men being commanded by Major-Gen. Wm. S. Graves. This expedition also is engaged in safeguarding allied interests and supplies landed for the former Russian Government. In a campaign to clear the country of Bolshevik troops along the Ussuri River the force advanced 420 miles, capturing Khabarovsk and other towns and villages along the railroads. The Japanese cavalry has been very active in driving back the Bolsheviki, while the American troops aided in the capture of Khaks, northwest of Vladivostok. Czecho-Slovak troops have been active in this area and in Siberia operating against the Bolsheviki.

Czecho-Slovaks Aid Allies.—A force of 50,000 Czecho-Slovak troops, near Kiev when the German invasion of the Ukraine began, made a remarkable retreat across Russia and Siberia. They had surrendered to the Russians to escape from further service in the Austrian Army and had later fought bravely and well under Kerensky. They now defeated Austrian and German troops at Bachmac, and against Bolshevik opposition made good their retreat in spite of many hardships and lack of arms, food, clothing and equipment. Scattered in the course of their 2,600 mile retreat all along the railroad from the region of the Don to Vladivostok, they have more than held their own in the fighting incident to the withdrawal. In many ways they have been of great assistance to the Allied cause, as often they were the only really effective force in existence and have made it possible for the All-Russian Government and some few elements of decency to hold out in Russia against the Bolshevik reign of terror. (See also II, *International Relations*; and *Russia, supra.*)

THE WAR AT SEA

The British Grand Fleet, aided by the fleets of the other Allies, has maintained the death grip it fixed upon the Central Powers four years ago. The seas, long since swept clean of Teutonic merchantmen, have been made increasingly unsafe for their undersea pirate craft, until as the war drew to a close the utter failure of the submarine campaign was apparent even to the German people. Evidence from German sources is not lacking that the blockade had brought the Central Powers to the verge of utter want, alike in foodstuffs and other such essentials as metals, cotton, wool, and leather. The British fleet was one of the decisive factors of the war.

The activities of the German navy were almost entirely restricted to their usual piracies and even more atrocious attacks on hospital ships. In this typically Hun style of warfare they succeeded during the year in sinking four hospital ships returning to England with wounded, bringing their total to six British and three Russian hospital ships during the war. The *Rewa* and *Glenart Castle* were sunk in Bristol Channel, the latter outside the restricted area and with a loss of 153 lives. The *Warilda,* with 800 wounded besides surgeons and nurses, and the *Landovry Castle* were the other victims. The *Landovry Castle's* life boats were shelled, 234 lives being lost, including surgeons and women nurses. All the vessels were plainly marked to show they were entitled to protection under the laws of war.

Enemy submarine activities were extended to the American coast on May 18, a number of vessels, including a lightship, being sunk, and mines planted, one of which sunk the cruiser *San Diego* off Fire Island, N. Y., on July 19, while another damaged the battleship *Minnesota* off Delaware Breakwater on Sept. 29. The trawler *Triumph*, captured off Nova Scotia, was armed and as a raider sunk several fishing boats. These raids did not delay the movement of troops or supplies overseas and had no bearing on the outcome of the war. The enemy maintained his reputation for brutal cold-bloodedness, sinking without warning and at times destroying lifeboats or otherwise killing crews.

The commerce raider *Wolf* reached a German port on Feb. 24 after a 15 months' cruise, having sunk 11 ships and bringing much booty and 400 prisoners.

Other offensive operations were a number of unimportant raids by destroyers or submarines, shelling British or French coast towns for a few minutes and then running away. Such attacks were delivered at Yarmouth, Dover and Dunkirk, among others.

Losses of Merchant Tonnage during the War.—The total loss of merchant tonnage as given by the British Admiralty was 15,053,386 gross tons, of a value of $3,000,000,000, due to marine hazards and enemy action. New shipping built was 10,849,527 gross tons, with 2,392,675 tons taken over from the enemy, leaving a net loss of 1,811,584. British losses were 9,031,828 tons, with a net loss of 3,443,012. Several hundred vessels sunk have been raised and repaired by the Royal Navy's salvage operations; 2,475 British ships were sunk with their crews and 3.147 sunk and their crews set adrift; 670 fishing boats were sunk, and merchant marine casualties exceeded 15,000 men; 151 American merchant vessels were lost during the war, 139 by submarine, five by mines and seven by enemy raiders (see also XI, *The Navy*).

Submarines Sunk or Captured.—Destroyers and submarines, submarine chasers, seaplanes, dirigibles and trawlers, with depth charges and armed naval guards on ships, hunted the enemy's submarines unceasingly. According to an Admiralty announcement 150 German and seven Austrian submarines had been sunk during the war to Aug. 1. Germany had built 331 and Austria 35, of which 119 were in the Atlantic and 46 in the Mediterranean. Including captures, the total accounted for was over 200, more than a reasonable proportion during the current year with the improvement in devices for their detection and destruction, especially mines and depth charges, and the number of destroyers and chasers increased. (See also XI, *The Navy.*)

Allied Naval Losses.—However, the blockade has not been maintained and loss of troopships and cargo boats prevented without risk and loss. Called on to operate and watch in all weathers and running without lights, there have been collisions, explosions, and loss by mine and torpedo, especially among the smaller guard craft. During the four years there has been a toll of 77 taken from a total of some 1,000 guardian destroyers—58 British, 10 during 1918, nine French, five Italian, three American, and two Japanese. Among other losses have been the Coast Guard cutters *Mohawk*, sunk by collision, and *Tampa*, by submarine, with loss of entire complement of 118 officers and men, after distinguished service with the navy in guarding convoys.

The British transport *Tuscania* with American troops was torpedoed off the north Irish coast on Feb. 5, 71 soldiers and 30 of the crew being lost. She was the only transport carrying American troops torpedoed. Other transports have been wrecked or damaged in collision, but the percentage of American lives lost in transporting the army overseas has been less than the German loss in moving their troops by rail from the east to the west front.

The American transport *President Lincoln* was sunk by torpedo on May 31 with loss of 28 lives, and the *Covington* on July 1, both while homeward bound. The collier *Cyclops*, with a cargo of Brazilian manganese, left Barbadoes on March 5 for Baltimore and has been officially listed as missing without trace.

Allied Naval Enterprises.—British warships attacked the Turkish cruisers *Sultan Yawaz Selim* and *Midilli*, formerly the *Goeben* and *Breslau*, at the mouth of the Dardanelles on Jan. 20. The *Breslau* was sunk, the *Goeben* damaged and stranded, the British losing two light monitors. Efforts to destroy the *Goeben* by bombing and torpedo failed, though aviators dropped 15 tons of bombs and made 16 hits; the submarine *E-14* was lost off Kum Kale in a further effort, but she was floated and repaired.

The British anti-submarine patrol engaged German vessels in Dover Straits on Feb. 15, and monitors shelled Ostend on March 22. Austrian vessels were attacked and driven into Durazzo on April 22, while four British destroyers engaged 11 German destroyers off the Belgian coast on June 27, the British withdrawing but not being followed. Ten German trawlers attempting to clear the Cattegat of mines were sunk by British vessels who saved all of the German crews.

British and French Block Submarine Bases.—A British attack at Ostend and Zeebrugge on April 13 with loss of a motor-boat was followed by a British and French attack on April 23 in which the channels used by enemy destroyers and submarines in putting to sea were blocked by sinking five obsolete cruisers filled with concrete. Under cover of mist and smoke screens the expedition ran boldly into the channels. British marines and bluejackets landed on the mole at Zeebrugge, doing much damage to stores and wharves, suffering a loss of 188 killed and 400 wounded. It was a most daring and gallant attack, and with the North Sea mine field (see XI, *The Navy*) seriously interfered with the enemy's submarine campaign. The Zeebrugge channel was almost completely blocked, that of Ostend partially. A similar enterprise at Ostend carried out on May 9 succeeded in sinking the old cruiser *Vindictive* across the channel between the piers, completely closing the channel to navigation.

Italians Sink Austrian Dreadnoughts.—The Italian Navy maintained its reputation for skill and daring by attacks similar to those of 1917. On May 14 they entered the Austrian naval base at Pola and escaped after torpedoing a dreadnought of the *Viribus Unitis* class. Again on June 10 Commanders Rizzo and Lugi de Milozzo in two small torpedo boats boldly attacked a battleship squadron through its protecting lines of destroyers off the Dalmatian coast, sinking the battleship *Szent Istvan* and badly damaging another. Italian vessels, aided by British and American light craft, entered the harbor of Durazzo on Oct. 2, destroying Austrian war vessels and the supply base there. The day before Austria surrendered they again attacked the Austrian fleet, sinking vessels of the *Viribus Unitis* class.

Russian Warships.—Eleven Russian and several British submarines formerly operating in the Baltic and fast in the ice at Hango and Helsingfors were destroyed on the approach of the Germans in April; three Russian battleships were blown up to prevent capture, while some 200 warships and vessels of all sorts escaped from Helsingfors to Kronstadt. The dreadnought *Volga*, seven battleships, seven cruisers, and numbers of smaller craft composing the Russian Black Sea Fleet fell into the hands of the Germans in June, but were in turn surrendered on Nov. 27 to the Allied fleet in the Black Sea.

German Navy Surrenders.—Thirteen dreadnoughts, battleships and battle cruisers, seven light cruisers and 50 destroyers, the first section of the German fleet, was surrendered to the Allied Fleet under Admiral Sir David Beatty on Nov. 21 off the Firth of Forth. On Nov. 20 the first contingent of 20 submarines had surrendered to Rear Admiral Trywhitt off Harwich, followed by similar surrenders on subsequent days until a total of 122, including a number of large cruiser undersea boats, had been turned over. (See also XI, *The Navy.*)

The British battleship *Brittania*, sunk by torpedo near the western entrance to the straits of Gibraltar on Nov. 9, was the last war vessel sunk before the armistice.

IV. THE NATIONAL ADMINISTRATION

THE PRESIDENT AND VICE-PRESIDENT

President.—Woodrow Wilson, Democrat, of New Jersey, inaugurated twenty-eighth President of the United States on March 4, 1913, was reelected on Nov. 7, 1916, for a second term of four years beginning March 4, 1917.

The President and Vice-President are elected for terms of four years by the state electoral colleges, whose membership is based on the Congressional apportionment. This apportionment is revised after each decennial census, as shown in the table in the YEAR BOOK for 1912 (p. 159). The official figures of the popular and electoral votes in the Presidential elections of 1908, 1912, and 1916 are given in the YEAR BOOK for 1916 (p. 170). The salary of the President is $75,000, with an allowance of $25,000 for traveling expenses.

Secretary to the President.—Joseph Patrick Tumulty, of New Jersey. The General Deficiency Appropriation Act continues the salary of the Secretary to the President at $7,500 per year, to which it was raised from the statutory amount of $6,000 in 1911 at the request of President Taft.

Vice-President.—Thomas Riley Marshall, Democrat, of Indiana, inaugurated Vice-President of the United States on March 4, 1913, was reelected on Nov. 7, 1916, for a second term of four years beginning March 4, 1917.

The Vice-President presides over the Senate, with no vote except in case of a tie. His salary is $12,000. The President *pro tempore* of the Senate, who presides in the absence of the Vice-President, is Senator Willard Saulsbury (Del.).

EXECUTIVE DEPARTMENTS

Ten Cabinet officers, constituting the President's advisory council, each in charge of one of the great Departments of the Government, are nominated by the President and confirmed by the Senate, for a term subject to the President's pleasure. The salary of the Cabinet officers is $12,000 each.

With the exception of the Secretary of State (appointed 1915), the Attorney-General (appointed 1914), the Secretary of War (appointed 1916), and the Secretary of the Treasury (appointed 1918), the members of the present Cabinet were nominated by the President and confirmed by the Senate on March 5, 1913. By Act of Congress, in the case of vacancy in office of President through the death or removal of both President and Vice-President, the Cabinet officers succeed to the Presidency in the order indicated in the following summary of the executive departments.

DEPARTMENT OF STATE

Secretary of State.—Robert Lansing, N. Y.

Charged with negotiations relating to foreign affairs.

Counselor.—Frank Lyon Polk, N. Y. $7,500.

Assistant Secretary.—William Phillips, Mass. $5,000.

Second Assistant Secretary.—Alvey A. Adee, D. C. $4,500.

Third Assistant Secretary.—Breckinridge Long, Mo. $4,500.

Director of the Consular Service.—Wilbur J. Carr, N. Y. $4,500.

Solicitor.—Lester H. Woolsey, N. Y. $5,000.

Foreign Trade Adviser.—Julius G. Lay, acting.

Mr. Lay succeeded Marion Letcher, who returned to consular duties, early in 1918.

Bureau of Accounts.—Chief, William McNeir, D. C. $2,450.

Bureau of Appointments.—Chief, Miles M. Shand, N. J. $2,100.

Bureau of Citizenship.—Chief, Richard W. Flournoy, Jr., Md. $3,000.

Consular Bureau.—Chief, Herbert C. Hengstler, O. $3,000.

Diplomatic Bureau.—Chief, Sydney Y. Smith, D. C. $2,250.

Bureau of Indexes and Archives.—Chief, David A. Salmon. $2,500.

Bureau of Rolls and Library.—Chief, John A. Tonner, O. $2,100.

Division of Latin-American Affairs.—Chief, Jordan H. Stabler. $4,500.

Division of Mexican Affairs.—Chief, ——— ———. $4,500.

Division of Far-Eastern Affairs.—Chief, Ransford S. Miller. $4,500.

Mr. Miller was appointed in 1918, succeeding Edward T. Williams.

Division of Near-Eastern Affairs.—Acting Chief, Albert H. Putney.

Division of Western European Affairs.—Acting Chief, Joseph C. Grew.

Mr. Grew, formerly secretary of embassy at Berlin, was detailed in 1918, succeeding Frederick A. Sterling.

TREASURY DEPARTMENT

Secretary of the Treasury.—Carter Glass, Va.

Carter Glass was born in Lynchburg, Va., Jan. 4, 1858. He was educated in public and private schools, and learned the printing trade, at which he worked for eight years before entering the publishing end of the newspaper business. He now owns the Lynchburg *Daily News* (morning) and *Daily Advance* (evening). Mr. Glass was a member of the Virginia Senate from 1899 to 1903. He then entered Congress as Representative of the Sixth District of Virginia, and served continuously until his appointment as Secretary of the Treasury, succeeding William Gibbs McAdoo, who resigned Nov. 21, 1918. Mr. Glass was nominated on Dec. 5, confirmed on Dec. 6 and took the oath of office on Dec. 16.

Charged with management of the national finances. He prepares plans for improvement of the revenue and support of the public credit; superintends collection of the revenue; grants warrants for all moneys paid from and into the Treasury; controls construction of public buildings; coinage and printing of money; and the administration of the Coast Guard and the Public Health Service; *ex officio* chairman of the Federal Reserve Board and of the Federal Farm Loan Board.

Assistant Secretaries.—L. S. Rowe, Pa., in charge of customs; James H. Moyle, Utah, in charge of public buildings; R. C. Leffingwell, N. Y., in charge of fiscal bureaus; Thos. B. Love, Tex., in charge of Bureaus Internal Revenue and War-Risk Insurance; Albert Rathbone, N. Y., in charge of Foreign Loan Bureau. $5,000 each.

Mr. Rathbone was confirmed on Sept. 3, succeeding Oscar T. Crosby.

Supervising Architect.——— ———, $5,000. Charged with superintending the construction and repair of public buildings.

This office has been vacant since June 30, 1915; James A. Wetmore, acting.

Engraving and Printing.—Chief of Bureau, James L. Wilmeth, Ark., $6,000. Produces all the securities and similar work of the Government printed from steel plates.

Secret Service.—Chief, ——— ———, $4,000. Charged with detection of counterfeiting, and similar frauds on the Government.

Comptroller of the Treasury.—Walter W. Warwick, O. $6,000. Construes the laws relating to appropriations and methods of rendering and stating accounts.

Treasurer of the United States.—John Burke, N. D. $8,000. Charged with the receipt and disbursement of all public moneys deposited in the Treasury and sub-treasuries and in national bank depositories.

Comptroller of the Currency.—John Skelton Williams, Va. $5,000. Has supervision of the national banks, their examination and reports; the preparation and issue of national bank circulation; the redemption and destruction of national bank notes. *Ex officio* a member of the Federal Reserve Board; and in this capacity draws a salary of $7,000 in addition to the salary of $5,000 attached to the office proper.

Internal Revenue.—Commissioner, Daniel C. Roper, S. C. $6,500. General supervision of the collection of all internal revenue taxes, including the income tax, and the enforcement of internal revenue laws.

The Mint.—Director, Raymond J. Baker, $5,000. General supervision of the mints and assay offices.

Farm Loan Board.—Created to administer the Federal farm-loan system. Composed of the Secretary of the Treasury, chairman *ex officio,* and four appointive members (full term, eight years; salary $10,000 per annum). The appointive members of the Board, with the terms for which they are commissioned, are as follows: George W. Norris, Pa., Farm Loan Commissioner (to 1920); Herbert Quick, W. Va. (to 1924); W. S. A. Smith, Iowa (to 1922); Charles E. Lobdell, Kan. (to 1918). Secretary, W. W. Flannagan.

Public Health Service.—Surgeon-General, Rupert Blue. $6,000. Charged with the framing and enforcement of regulations for the prevention of the introduction and spread of contagious diseases; supervision of the quarantine service of the United States, and of the marine hospitals.

Coast Guard.—Captain Commandant, Ellsworth P. Bertholf. $5,000.

Bureau of War-Risk Insurance.—Director, Col. D. L. Lindsley. Administers the allotments and allowances to dependents of soldiers and sailors; compensation and insurance for soldiers and sailors; marine war-risk insurance, etc.

Colonel Lindsley, in civil life president of the Southwestern Life Insurance Co., was appointed on Dec. 16.

War Department

Secretary of War.—Newton Diehl Baker, Ohio.

Charged with supervision of national defense and expenditures for military purposes.

Assistant Secretary of War.—Benedict Crowell, Ohio. $5,000.

Second Assistant Secretary of War.— ——— ———.

Third Assistant Secretary of War.—Frederick P. Keppel, N. Y. $5,000.

The offices of Second and Third Assistant Secretary of War were created by an act of April 6. John D. Ryan was confirmed as Second Assistant Secretary on Sept. 3, succeeding Edward R. Stettinius (confirmed April 8), and resigned in November. Mr. Keppel was confirmed on April 18.

The General Staff.—Chief of Staff, Gen. Peyton C. March. $10,000. Charged with preparation of plans for the national defense, and the promotion of the efficiency of the Army.

General March became acting chief of staff on March 4, succeeding Major-Gen. Tasker H. Bliss, and was confirmed on May 24.

The chiefs of the military bureaus are as follows:

Adjutant-General.—Major-Gen. P. C. Harris. $8,000.

General Harris was confirmed on Oct. 10, succeeding Major-Gen. H. P. McCain.

Inspector-General.—Major-Gen. John L. Chamberlain. $8,000.

Judge-Advocate-General and *Provost-Marshal-General.*—Major-Gen. E. H. Crowder. $8,000.

Quartermaster-General. — Major-Gen. Harry L. Rogers. $8,000.

General Rogers was confirmed on Aug. 23, succeeding Major-Gen. H. S. Sharpe.

Surgeon-General.—Major-Gen. Merritte W. Ireland. $8,000.

General Ireland was confirmed on Oct. 10, succeeding Major-Gen. Wm. C. Gorgas, retired.

Chief of Coast Artillery.—Major-Gen. Frank W. Coe. $8,000.

General Coe was confirmed on May 23, succeeding Major-Gen. Erasmus M. Weaver, retired.

Chief of Engineers.—Major-Gen. William M. Black. $8,000.

Chief of Ordnance.—Major-Gen. Clarence C. Williams. $8,000.

General Williams was confirmed on July 13, succeeding Major-Gen. Charles B. Wheeler.

Chief Signal Officer. — Major-Gen. George O. Squier. $8,000.

Chief of Bureau of Insular Affairs.—Major-Gen. Frank McIntyre. $8,000.

Chief of Militia Bureau.—Major-Gen. Jesse McI. Carter. $8,000.

Director of Military Aeronautics.—Major-Gen. Wm. L. Kenly. $8,000.

Director of Air Service.—Major-Gen. Charles T. Menoher. $8,000.

Department of Justice

Attorney General.—Thomas Watt Gregory, Tex. (resigned March 4, 1919).

Represents the United States in all legal matters.

Solicitor-General.—Alexander C. King, Ga. $10,000. Charged with the business of the Government in the Supreme Court and in state courts.

Mr. King was confirmed on Nov. 21, succeeding John W. Davis, appointed Ambassador to Great Britain.

Assistant to the Attorney-General.—George Carroll Todd, N. Y. $9,000. Charged with matters arising under the Federal anti-trust and interstate commerce laws.

Assistant Attorney-General.—One at $8,000 (customs division) and six at $7,500.

Post Office Department

Postmaster-General.—Albert Sidney Burleson, Tex.

Has direction and management of the Post Office.

First Assistant Postmaster-General.—John C. Koons, D. C. $5,000. Charged with postmasters' appointments; salaries and allowance; city delivery service.

Second Assistant Postmaster-General.—Otto Praeger, Tex. $5,000. Charged with railway adjustments, miscellaneous transportation, foreign mails, railway mail service, inspection, equipment.

Third Assistant Postmaster-General.—Alexander M. Dockery, Mo. $5,000. Charged with financial system, stamps, money orders, registered mails, classification of domestic mail matter, redemption, postal savings.

Fourth Assistant Postmaster-General.—James I. Blakslee, Pa. $5,000. Charged with rural mails, supplies, dead letters, post route maps.

Navy Department

Secretary of the Navy.—Josephus Daniels, N. C.

Charged with direction of the Navy and superintendence of construction, equipment, and employment of vessels of war.

Assistant Secretary.—Franklin D. Roosevelt, N. Y. $5,000.

Office of Naval Operations.—Chief, Adm. William S. Benson. $10,000. Charged with the operations of the fleet and with the preparation and readiness of plans for its use in war.

Bureau of Yards and Docks.—Chief, Rear-Adm. Charles W. Parks. $8,000. Charged with the construction and maintenance of docks and naval buildings.

Admiral Parks was confirmed on Jan. 10, succeeding Rear-Adm. Frederic R. Harris.

Bureau of Navigation.—Chief, Rear-Adm. Victor Blue. $6,000. Charged with the education and supervision of line officers and of enlisted men, marine surveys, and the supervision of the Naval Militia.

Admiral Blue was confirmed on Dec. 19, succeeding Rear-Adm. Leigh C. Palmer.

Bureau of Ordnance.—Chief, Rear-Adm. Ralph Earle. $6,000. Charged with supervision of the Torpedo Station, magazines on shore, and with the manufacture of explosives, arms and equipment.

Bureau of Construction and Repair.—Chief Constructor, David W. Taylor. $6,000. Charged with the design, construction, care, and repair of ships.

Bureau of Steam Engineering.—Engineer-in-Chief, Rear-Adm. Robert S. Griffin. $6,000. Charged with designing, building and repairing machinery for naval ships.

Bureau of Supplies and Accounts.—Paymaster-Gen. Samuel McGowan. $8,000. Charged with the supply of funds for disbursing officers, and the purchase of all naval supplies.

Bureau of Medicine and Surgery.—Surgeon-General, William C. Braisted. $8,000. Control of naval hospitals and hospital ships.

Judge-Advocate-General. — Rear-Adm. George R. Clark. $5,000. Charged with supervision of all legal aspects of the Navy personnel.

Admiral Clark was confirmed on Feb. 14, succeeding Capt. Wm. C. Watts.

Marine Corps.—Commandant, Major-Gen. George Barnett. $8,000.

DEPARTMENT OF THE INTERIOR

Secretary of the Interior.—Franklin Knight Lane, Cal.

Charged with patents, pensions, public lands and parks, education, Indian affairs, geological surveys, reclamation of arid lands, and mines.

First Assistant Secretary.—Alexander T. Vogelsang, Cal. $5,000.

Assistant Secretary.—Selden S. Hopkins, Wyo., $4,500.

General Land Office.—Commissioner, Clay Tallman, Nev. $5,000. Charged with the survey, management and disposition of the public lands.

Patent Office.—Commissioner, James T. Newton, Ga. $5,000. Administration of the patent laws, and supervision of the registration of trade-marks.

Pension Office.—Commissioner, Gaylord M. Saltzgaber, Ohio. $5,000. Supervision of adjudication of claims arising under laws granting Army or Navy service pensions prior to Oct. 6, 1917.

Office of Indian Affairs.—Commissioner, Cato Sells, Tex. $5,000. Has charge of the Indian tribes of the United States (exclusive of Alaska).

Bureau of Education.—Commissioner, Philander P. Claxton, Tenn. $5,000. Collects statistics and general information regarding education; has charge of the schools for native Alaskan children; and administers the endowment fund for colleges of agriculture and mechanic arts.

Geological Survey.—Director, George Otis Smith, Me. $6,000. Charged with classification of the public lands and examination of the geologic structure, mineral resources, and the mineral products of the national domain.

Reclamation Service.—Director and Chief Engineer, Arthur P. Davis. $7,500. Charged with the survey, construction, and operation of the reclamation and irrigation works in arid states, authorized by the act of June 17, 1902.

Bureau of Mines.—Director, Vannoy H. Manning, Miss. $6,000. To promote the mining industry of the United States, foster the safety of miners, and give attention to the treatment of ores and the use of explosives.

National Park Service. — Director, Steven T. Mather, Ill. $4,500. Charged with the administration of the national parks and national monuments.

DEPARTMENT OF AGRICULTURE

Secretary of Agriculture. — David Franklin Houston, Mo.

Exercises supervision over agricultural industry, experiment stations, quarantine stations for imported cattle, inspection of foods and drugs, national forest reserves, and interstate game laws.

Assistant Secretary.—Carl Vrooman, Ill. $5,000.

Weather Bureau.—Chief, Charles F. Marvin, D. C. $5,000. Charged with forecasting of weather for the benefit of agriculture, commerce and navigation.

Bureau of Animal Industry.—Chief, John R. Mohler, D. C. $5,000. Conducts inspection of animals and meat food products; investigates communicable diseases and their prevention, and the breeding and feeding of animals.

Mr. Mohler was appointed in 1918, succeeding A. D. Melvin, died Dec. 7, 1917.

Bureau of Plant Industry.—Chief, William A. Taylor, Mich. $5,000. Charged with the improvement of crops by breeding and selection, and the introduction of new plants and seeds to different parts of the United States.

Forest Service.—Chief, Henry S. Graves, Conn. $5,000. Charged with the administration of the national forests, the investigation of forest problems and encouragement of protecting growing timber.

Bureau of Chemistry.—Chief, Carl L. Alsberg, Mass. $5,000. Charged with the analysis of agricultural products and fertilizers, and the investigation of the composition and adulteration of foods and drugs.

Bureau of Soils.—Chief, Milton Whitney, Md. $4,000. Charged with investigating soils in their relations to climate and organic life.

Bureau of Entomology.—Chief, L. O. Howard, N. Y. $4,500. Charged with dissemination of information regarding injurious insects affecting forests, crops and fruits, and means of their elimination.

Bureau of Biological Survey.—Chief, E. W. Nelson, Ariz. $3,500. Investigates the economic relations of animal life. Charged with enforcing the bird and game laws.

Bureau of Crop Estimates.—Chief, Leon M. Estabrook, Tex. $4,000. Collects and collates agricultural statistics and issues crop reports and forecasts. This bureau was called the Bureau of Statistics until 1914.

States Relations Service.—Director, A. C. True, Conn. $4,500. Charged with the supervision and promotion of agricultural education and the maintenance of agricultural experiment stations.

Office of Public Roads and Rural Engineering. — Director, ——— ———. $4,500. Charged with investigating road making, road maintenance and road materials, the conduct of irrigation and drainage investigations, and the study of other rural engineering problems.

Logan Waller Page died on Dec. 9; his successor has not been appointed.

Office of Markets and Rural Organization.—Chief, Charles J. Brand, Ill. $4,500. Charged with the conduct of investigations of rural economics and co-operative organization.

Office of Farm Management.—Chief, ——— ———. $4,000. Charged with the study and improvement of farm practice.

Department of Commerce

Secretary of Commerce.—William Cox Redfield, N. Y.

Charged with promoting commerce, mining, manufacturing, shipping, fisheries, and transportation.

Assistant Secretary.—Edwin F. Sweet, Mich. $5,000.

Bureau of Foreign and Domestic Commerce.—Chief, Burwell S. Cutler, N. Y. $6,000. Charged with the collection and publication of statistics of foreign and domestic commerce, the development of manufactures and markets therefore, by the publication of information, and the investigation of matters affecting the commercial interest of the United States.

Bureau of Lighthouses.—Commissioner, George R. Putnam, Ia. $5,000. Charged with the administrative duties relating to lighthouses and protective signals.

Steamboat Inspection Service.—Supervising Inspector-General, George Uhler, Penn. $5,000. Charged with the inspection of vessels, the licensing of officers, and the administration of laws relating to steam vessels and their officers.

The Census Office.—Director, Samuel L. Rogers, N. C. $7,000 during decennial census period, $6,000 regular salary. The duty of the Census Office is to take, compile and publish the decennial census of the United States; the quinquennial census of agriculture and manufactures; the deaths in registration areas; the statistics of cotton ginned, and of cotton consumed; the annual statistics of cities; and to make such other statistical investigations as Congress may order.

Coast and Geodetic Survey.—Superintendent, E. Lester Jones, Va. $6,000. Charged with survey of coasts under the jurisdiction of the United States, and publication of charts covering these coasts.

Bureau of Fisheries.—Commissioner, Hugh M. Smith, D. C. $6,000. Charged with the propagation of useful food fishes, investigation of deep sea fishing grounds, and care of the Alaska salmon fisheries and the Pribilof Islands seals.

Bureau of Navigation.—Commissioner, Eugene T. Chamberlain, N. Y. $4,000. Charged with superintendence of the commercial marine, issue of licenses, and collection of tonnage taxes.

Bureau of Standards.—Director, Samuel W. Stratton, Ill. $6,000. Charged with comparing and testing standards used in scientific investigations, commerce and educational institutions with standards adopted or recognized by the Government.

Department of Labor

Secretary of Labor.—William Bauchop Wilson, Pa.

Charged with the duty of fostering, promoting and developing the welfare of the wage earners of the United States.

Assistant Secretary.—Louis F. Post, Ill. $5,000.

Bureau of Immigration.—Commissioner-General, Anthony Caminetti, Cal. $5,000. Charged with administration of immigration laws.

Bureau of Naturalization.—Commissioner, Richard K. Campbell, Va. $4,000. Charged with administration of the naturalization laws.

Bureau of Labor Statistics.—Commissioner, Royal Meeker, N. J. $5,000. Charged with the duty of acquiring and diffusing information concerning labor in its relations to capital and means of promoting prosperity among the laboring classes.

Children's Bureau.—Chief, Julia C. Lathrop, Ill. $5,000. Charged with the investigation of all matters pertaining to the welfare of children and child life.

United States Employment Service.—Director-General, John B. Densmore. $6,000.

Independent Bureaus and Institutions

Interstate Commerce Commission.—Nine members, each receiving an annual salary of $10,000; appointed for a term of seven years. Expiration of term indicated. Winthrop M. Daniels, N. J., Chairman, 1923; Harry C. Hall, Col., 1921; Balthaser H. Meyer, Wis., 1924; James S. Harlan, Ill., 1925; Edgar E. Clark, Iowa, 1919; Charles C. McChord, Ky., 1922; Robert W. Wooley, Va., 1920; Clyde B. Aitchison, Ore., 1921; ——— ———, 1922. Secretary, George B. McGinty, Ga., salary, $5,000. Mr. Daniels succeeds Mr. Hall as chairman. Joseph B. Eastman, Mass., was nominated on Dec. 19, *vice* George W. Anderson, resigned.

Federal Reserve Board.—Created by the Federal Reserve Act of Dec. 23, 1913, for the supervision of the Federal reserve system. Composed of five appointive members (full term, 10 years; salary, $10,000 per annum) and the Secretary of the Treasury and the Comptroller of the Currency *ex officio*. The appointive members of the board, with the dates on which their terms expire, are as follows: Wm. P. G. Harding, Ala., governor (1922); Albert Strauss, N. Y., vice-governor (1928); ——— ———, (1920); Adolph C. Miller, Cal. (1924); Charles S. Hamlin, Mass. (1926). Secretary, J. A. Broderick, salary, $5,000. Mr. Strauss was confirmed on Oct. 24, succeeding Paul M. Warburg on the expiration of his term. Frederic A. Delano resigned on June 26; his successor has not been appointed.

Federal Trade Commission.—Created by the Federal Trade Commission Act of Sept. 26, 1914. Endowed by that Act and by the Clayton Anti-trust Act of Oct. 15, 1914, with powers of investigation and publicity over corporations and certain *quasi* judicial functions in the enforcement of anti-trust laws. Composed of five appointive members (full term, seven years), at salaries of $10,000 per annum. The members of the Board are as follows: William B. Colver, Chairman, John Franklin Fort, Victor Murdock, Huston Thompson, ——— ———. Secretary, Leonidas L. Bracken, salary, $5,000.

Mr. Thompson was confirmed on Jan. 9, 1919, for the term expiring Sept. 25, 1919, *vice* William J. Harris, resigned Feb. 12, 1918. Joseph E. Davies resigned on Feb. 25; his successor has not been appointed. Mr. Murdock was reappointed for the full term of seven years and confirmed on Oct. 3.

United States Shipping Board.—Created by the Shipping Act of Sept. 7, 1916. Charged with the administration of the Government fleet of merchant vessels and with the regulation of marine carriers. Composed of five appointive members (full term, six years) at salaries of $7,500 per annum. The members of the Board are as follows: Edward N. Hurley, Chairman; Raymond B. Stevens, Vice-Chairman; John A. Donald, Bainbridge Colby, Charles R. Page, Commissioners.

Mr. Page was reappointed for the full term of six years and confirmed on Dec. 6.

United States Employees' Compensation Commission.—Created by the Employees' Compensation Act of Sept. 7, 1916, for the administration of the system of compensation for Federal employees established by the Act. Composed of three appointive members (full term, six years) at salaries of $4,000 per annum. The members of the Commission are: Mrs. Frances C. Axtell, Chairman, John J. Keegan, Charles H. Verrill.

United States Board of Mediation and Conciliation.—Created by an Act of July 15, 1913, for the purpose of settling by mediation, conciliation and arbitration industrial disputes at the request of parties thereto. Composed of a commissioner (term, seven years; salary, $7,500), an assistant commissioner (salary, $5,000) and not more than two other members. The present members of the Board are: Wm. L. Chambers, Commissioner; G. W. W. Hanger, Assistant Commissioner; Martin A. Knapp, Chairman.

Civil Service Commission.—Commissioners, John A. McIlhenny, La., president, $4,500; Charles M. Galloway, S. C., $4,000; Hermon W. Craven, Wash., $4,000. Charged with the conduct of competitive examinations of applicants for the classified civil service.

Government Printing Office.—Public Printer, Cornelius Ford, N. J. $5,500. Charged with the printing, press work, and binding of all Government publications of every description.

The Library of Congress.—Librarian, Herbert Putnam, Mass. $6,500. Primarily a reference library, composed of numerous collections, presented and bought. It is the third largest collection in the world. Under the jurisdiction of Congress.

Commission of Fine Arts.—Established 1910, to pass upon sites and plans for future buildings, monuments, etc., in the District of Columbia. No compensation, but actual expenses allowed. Chairman, Charles Moore, Mich.; vice-chairman, James L. Greenleaf, N. Y., landscape architect; Herbert Adams, N. Y.; J. Alden Weir, N. Y., painter; Charles A. Platt, N. Y., architect; John R. Pope, N. Y., architect; William M. Kendall, N. Y., architect. Secretary, Col. C. S. Ridley.

Mr. Greenleaf was appointed in 1918, succeeding Frederick Law Olmstead.

Smithsonian Institution. — Secretary, Charles D. Walcott. $7,500. Established 1846, under the terms of James Smithson's will, for the "increase and diffusion of knowledge among men." The former is accomplished by promoting original scientific research, and the latter by publication and lectures. Managed by a Board of Regents. It cooperates with the Government and national scientific bodies.

Under the direction of the Smithsonian institution are the National Museum, charged with preserving and utilizing objects of art and ethnological, geological and mineralogical collections belonging to the United States; and the Bureau of American Ethnology

Pan-American Union. — Director-General, John Barrett, Ore. $7,500. Established for the purpose of developing closer relations of commerce and friendship between the twenty-one republics of the Western Hemisphere.

IV. THE NATIONAL ADMINISTRATION

THE SIXTY-FIFTH CONGRESS

The Senate.—A complete list of the members of the Senate in the Sixty-fifth Congress at the end of 1917 was given in the YEAR BOOK for 1917 (p. 153). The changes during the year were as follows. James H. Brady (Rep.) of Idaho, died Jan. 13, succeeded by John F. Nugent (Dem.); Ollie M. James (Dem.) of Kentucky, died Aug. 28, succeeded by George B. Martin (Dem.); Robert F. Broussard (Dem.) of Louisiana, died April 12, succeeded by Edward J. Gay (Dem.); Wm. J. Stone (Dem.) of Missouri, died April 14, succeeded by Selden P. Spencer (Rep.); Jacob H. Gallinger (Rep.) of New Hampshire, died Aug. 17, succeeded by George H. Moses (Rep.); William Hughes (Dem.) of New Jersey, died Jan. 30, succeeded by David Baird (Rep.); Ben R. Tillman (Dem.) of South Carolina, died July 3, succeeded by Wm. P. Pollock (Dem.); Charles B. Henderson (Dem.) succeeded Senator Key Pittman of Nevada, died Dec. 24, 1917; Irvine L. Lenroot (Rep.) succeeded Senator Paul O. Husting, died Oct. 24, 1917. At the beginning of the final session of the Sixty-fifth Congress the composition of the Senate was: Democrats, 52; Republicans, 44.

House of Representatives.—A complete list of the members of the House of Representatives in the Sixty-fifth Congress at the end of 1917 was given in the YEAR BOOK for 1917 (p. 154). The changes during the year were as follows: Wm. C. Adamson (Dem.) of the 4th Georgia resigned, succeeded by Wm. C. Wright (Dem.); John W. Rainey (Dem.) succeeded Charles Martin (Dem.), died Oct. 29, 1917, in the 4th Illinois; J. A. Sterling (Rep.) of the 17th Illinois, died Oct. 17, succeeded by Frank L. Smith (Rep.); J. F. C. Talbott (Dem.) of the 2d Maryland, died Oct. 5, succeeded by Carville D. Benson (Dem.); J. E. Meeker (Rep.) of the 10th Missouri, died Oct. 16, succeeded by Frederick Essen (Rep.); J. H. Capstick (Rep.) of the 5th New Jersey, died March 17, succeeded by Wm. F. Birch (Rep.); J. J. Fitzgerald (Dem.) of the 7th New York, resigned, succeeded by John J. Delaney (Dem.); D. J. Griffin (Dem.) of the 8th New York, resigned, succeeded by Wm. E. Cleary (Dem.); Murray Hulbert (Dem.) of the 21st New York, resigned, succeeded by J. F. Donovan (Dem.); Henry Bruckner (Dem.) of the 22d New York, resigned, succeeded by Anthony J. Griffin (Dem.); Martin L. Davey (Dem.) succeeded E. L. Bathrick (Dem.), died Dec. 24, 1917, in the 14th Ohio; W. A. Jones (Dem.) of the 1st Virginia, died April 17, succeeded by S. O. Bland (Dem.); Carter Glass (Dem.) of the 6th Virginia resigned in December to become Secretary of the Treasury; J. H. Davidson (Rep.) of the 6th Wisconsin, died Aug. 6, succeeded by F. Lampert (Rep.); I. L. Lenroot (Rep.) of the 11th Wisconsin, resigned to enter the Senate, succeeded by A. P. Nelson (Rep.). At the beginning of the final session of the Sixty-fifth Congress the composition of the House was: Democrats, 217; Republicans, 212; Progressives, 2; Independents, 2; Prohibitionist, 1; Socialist, 1.

Second Session.—The second session of the Sixty-fifth Congress opened on Dec. 3, 1913, and ended on Nov. 21. The principal bills of public interest enacted during the session were the following, the dates being those of the President's approval:

S. 383. To punish the willful injury or destruction of war material, or of war premises or utilities used in connection with war material, and for other purposes. Public, No. 135. April 20.

S. 1544. To provide for appeals from decisions of boards of local inspectors of vessels, and for other purposes. Public, No. 166. June 10.

S. 1545. To amend the Act of March 3, 1913, entitled "An Act to regulate the officering and manning of vessels subject to the inspection laws of the United States." Public, No. 147. May 11.

S. 1546. To permit the use of certain refined products of petroleum as stores on steam vessels carrying passengers. Public, No. 110. March 29.

S. 1549. To require numbering and recording of undocumented vessels. Public, No. 165. June 7.

S. 1553. To give effect to the convention between the United States and Great Britain for the protection of migratory birds, concluded at Washington, Aug. 16, 1916, and for other purposes. Public, No. 186. July 3.

S. 1854. To save daylight and to provide standard time for the United States. Public, No. 106. March 19.

S. 2334. To authorize absence by homestead settlers and entrymen, and for other purposes. Dec. 20, 1917.

S. 2380. Granting to the Legislature of the Territory of Hawaii additional powers relative to elections and qualification of electors. Public, No. 168. June 13.

S. 3006. To authorize and empower officers and enlisted men of the Navy and Marine Corps to serve under the Government of the Dominican Republic, and for other purposes. Public, No. 100. Feb. 11.

S. 3129. To provide for the disposition of the effects of deceased persons in the naval service. Public, No. 111. March 29.

S. 3235. Amending Sec. 32, Federal Farm Loan Act, approved July 17, 1916. Public, No. 95. Jan. 18.

S. 3388. To amend the emergency shipping fund provisions of the urgent deficiency appropriation Act approved June 15, 1917, so as to empower the President and his designated agents to take over certain transportation systems for the transportation of shipyard and plant employees, and for other purposes. Public, No. 138. April 22.

S. 3389. To authorize and empower the United States Shipping Board Emergency Fleet Corporation to purchase, lease, requisition, or otherwise acquire, and to sell or otherwise dispose of improved or unimproved land, houses, buildings, and for other purposes. Public. No. 102. March 1.

S. 3401. To authorize the President to reduce temporarily the course of instruction at the United States Naval Academy. Public, No. 117. April 2.

S. 3402. To fix the age limit for candidates for admission to the United States Naval Academy. Public, No. 148. May 14.

S. 3404. To authorize the President to drop from the rolls any Naval or Marine Corps officer absent without leave for three months, or who has been convicted of any offense punishable by confinement in the penitentiary by the civil authorities, and prohibiting such officer's reappointment. Public, No. 116. April 2.

S. 3438. To prevent corrupt practices in the election of Senators, Representatives, or Delegates to Congress. Public, No. 222. Oct. 16.

S. 3471. To authorize the Secretary of War to grant furloughs without pay and allowances to enlisted men of the Army of the United States. Public, No. 105. March 16.

S. 3528. To suspend for the period of the present war Secs. 45, 46, and 56 of an Act entitled "An Act for making further and more effectual provision for the national defense, and for other purposes," approved June 3, 1916, and for other purposes. Public, No. 132. April 17.

S. 3714. To provide further for the national security and defense, and, for the purpose of assisting in the prosecution of the war, to provide credits for industries and enterprises in the United States necessary or contributory to the prosecution of the war, and to supervise the issuance of securities and for other purposes. Public, No. 121. April 5.

S. 3752. To provide for the operation of transportation systems while under the Federal control, for the just compensation of their owners, and for other purposes. Public, No. 107. March 21.

S. 3771. Authorizing the President to coördinate or consolidate executive bureaus, agencies and offices, and for other purposes, in the interest of economy and the more efficient concentration of the Government. Public, No. 150. May 20.

S. 3803. Authorizing the President during the existing emergency to sell supplies, materials, equipment, or other property, heretofore or hereafter purchased, acquired or manufactured by the United States, in connection with, or incidental to, the prosecution of the war. Public, No. 145. May 10.

S. 3911. Authorizing national banks to subscribe to the American National Red Cross. Public, No. 153. May 22.

S. 3935. To prohibit the sale, manufacture, and importation of intoxicating liquors in the Territory of Hawaii during the period of the war, except as hereinafter provided. Public, No. 157, May 23.

S. 4208. Authorizing postage rates on aeroplane mail. Public, No. 146. May 10.

S. 4292. To conserve the gold supply of the United States; to permit the settlement in silver of trade balances adverse to the United States; to provide silver for subsidiary coinage and for commercial use; to assist foreign governments at war with the enemies of the United States; and for the above purposes to stabilize the price and encourage the production of silver. Public, No. 139. April 23.

S. 4409. To amend Sec. 15 of the Act approved June 3, 1916, entitled "An Act for making further and more effectual provision for the national defense, and for other purposes," as amended by the Act approved May 12, 1917, entitled "An Act making appropriations for the support of the army for the fiscal year ending June 30, 1918, and for other purposes." Public, No. 158. May 25.

S. 4444. To pension widows and minor children of officers and enlisted men who served in the war with Spain, Philippine Insurrection, or in China. Public, No. 199. July 16.

S. 4557. To provide for vocational rehabilitation and return to civil employment of disabled persons discharged from the military or naval forces of the United States, and for other purposes. Public, No. 178. June 27.

S. J. Res. 63. To establish a reserve of the Public Health Service. Public Res., No. 45. Oct. 27.

S. J. Res. 106. Extending until Jan. 1, 1919, the effective date of Sec. 10 of the Act entitled "An Act to supplement existing laws against unlawful restraints and monopolies, and for other purposes," approved Oct. 15, 1914. Public Res., No. 20. Jan. 12.

S. J. Res. 111. Declaring that a state of war exists between the Imperial and Royal Austro-Hungarian Government and the Government and the people of the United States, and making provision to prosecute the same. Public Res., No. 17. Dec. 17, 1917.

S. J. Res. 123. Providing for the calling into military service of certain classes of persons registered and liable for military service under the terms of the Act of Congress approved May 18, 1917, entitled "An Act to authorize the President to increase temporarily the Military establishment of the United States." Public Res., No. 29. May 16.

S. J. Res. 124. Providing for the registration for military service of all male persons citizens of the United States, and all male persons residing in the United States who have, since the fifth day of June, 1917, and on or before the day set for the registration by proclamation by the President, attained the age of 21 years, in accordance with such rules and regulations as the President may prescribe under the terms of the Act approved May 18, 1917, entitled "An Act to authorize the President to increase temporarily the Military Establishment of the United States." Public Res., No. 30. May 20.

S. J. Res. 133. Authorizing the granting of insurance under the Act entitled "An Act to authorize the establishment of a Bureau of War Risk Insurance in the Treasury Department," approved Sept. 2, 1914, as amended by the Act approved Oct. 6, 1917, on application by a person other than the person to be insured. Public Res., No. 27. April 2.

S. J. Res. 152. To prevent rent profiteering in the District of Columbia. Public Res., No. 31. May 31.

S. J. Res. 172. Authorizing the President to establish zones in which intoxicating liquors may not be sold, manufactured or distributed. Public Res., No. 40. Sept. 12.

H. R. 2316. To promote export trade, and for other purposes. Public, No. 126. April 10.

H. R. 2617. To ratify the compact and agreement between the states of Oregon and Washington regarding concurrent jurisdiction over the waters of the Columbia River and its tributaries in connection with regulating, protecting, and preserving fish. Public, No. 123. April 8.

H. R. 3132. To amend the naturalization laws and to repeal certain sections of the Revised Statutes of the United States and other laws relating to naturalization, and for other purposes. Public, No. 144. May 9.

H. R. 6361. To extend protection to the civil rights of members of the military and naval establishments of the United States engaged in the present war. Public, No. 103. March 8.

H. R. 6967. To increase the number of midshipmen in the U. S. Naval Academy. Public, No. 93. Dec. 20, 1917.

H. R. 7697. To authorize the calling into the service of the United States of the militia and other locally created armed forces in the Philippine Islands, and for other purposes. Public, No. 97. Jan. 26.

H. R. 8563. To amend the homestead law in its application to Alaska, and for other purposes. Public, No. 180. June 28.

H. R. 8753. An Act to amend Sec. 3, Title 1, of the Act entitled "An Act to punish acts of interference with the foreign relations, the neutrality, and the foreign commerce of the United States, to punish espionage, and better to enforce the criminal laws of the United States, and for other purposes," approved June 15, 1917, and for other purposes. Public, No. 150. May 16.

H. R. 8938. To equip the United States Penitentiary, Atlanta, Georgia, for the manufacture of supplies for the use of the Government, for the compensation of prisoners for their labor, and for other purposes. Public, No. 194. July 10.

H. R. 9504. An Act to amend Sec. 4067 of the Revised Statutes by extending its scope to include women. Public, No. 131. April 16.

H. R. 9571. To authorize the appointment of officers of the Philippine Scouts as officers in the militia or other locally created armed forces of the Philippine Islands drafted into the service of the United States, and for other purposes. Public, No. 114. March 30.

H. R. 9901. To give indemnity for damages caused by American forces. Public, No. 133. April 18.

H. R. 9902. To amend Sec. 8 of an Act entitled "An Act to authorize the President to increase temporarily the Military Establishment of the United States," approved May 18, 1917. Public, No. 137. April 20.

H. R. 9959. To amend an Act entitled "An Act granting pensions to certain enlisted men, soldiers, and officers who served in the Civil War and the War with Mexico," approved May 11, 1912. Public, No. 167. June 10.

H. R. 10069. An Act making appropriations for the construction, repair and preservation of certain public works on rivers and harbors, and for other purposes. Public, No. 200. July 18.

H. R. 10205. To provide for the consolidation of national banking associations. Public, No. 240. Nov. 7.

H. R. 10264. To prevent in time of war departure from or entry into the United States contrary to the public safety. Public, No. 154. May 22.

H. R. 10265. To authorize the President to provide housing for war needs. Public, No. 149. May 16.

H. R. 10852. To provide for the appointment of a commission to standardize screw threads. Public, No. 201. July 18.

H. R. 10854. Making appropriations for the naval service for the fiscal year ending June 30, 1919, and for other purposes. Public, No. 182. July 1.

H. R. 11084. To amend the War-Risk Insurance Act. Public, No. 195. July 11.

H. R. 11123. To amend an Act approved Sept. 24, 1917, entitled "An Act to authorize an additional issue of bonds to meet expenditures for the national security and defense, and for the purpose of assisting in the prosecution of the war, to extend additional credit to foreign governments, and for other purposes." Public, No. 120. April 4.

H. R. 11245. To amend an Act entitled "An Act to authorize the establishment of a Bureau of War Risk Insurance in the Treasury Department," approved Sept. 2, 1914, as amended. Public, No. 151. June 25.

H. R. 11247. Providing for the protection of the uniform of friendly nations and for other purposes. Public, No. 190. July 8.

H. R. 11259. To provide further for the national security and defense by encouraging production, conserving the supply, and controlling the distribution of those ores, metals, and minerals which have formerly been largely imported, or of which there is or may be an inadequate supply. Public, No. 220. Oct. 5.

H. R. 11283. To amend and reënact sections four, eleven, sixteen, nineteen, and twenty-two of the Act approved December 23, 1913, and known as the Federal Reserve Act, and sections fifty-two hundred and eight and fifty-two hundred and nine, Revised Statutes. Public, No. 218. Sept. 26.

H. R. 11945. To enable the Secretary of Agriculture to carry out, during the fiscal year ending June 30, 1919, the purposes of the act entitled "An Act to provide further for the national security and defense by stimulating agriculture and facilitating the distribution of agricultural products, and for other purposes." Public, No. 243. Nov. 21.

H. R. 12098. To protect the lives and health and morals of women and minor workers in the District of Columbia, and to establish a minimum wage board, and define its powers and duties, and to provide for the fixing of minimum wages for such workers, and for other purposes. Public, No. 215. Sept. 19.

H. R. 12099. To confer on the President power to prescribe charter rates and freight rates and to requisition vessels, and for other purposes. Public, No. 202. July 18.

H. R. 12100. To amend an Act approved September 7, 1916, entitled "An Act to establish a United States Shipping Board, etc." Public, No. 198. July 15.

H. R. 12280. Making appropriations to supply additional urgent deficiencies in appropriations for the fiscal year ending June 30, 1918, on account of war expenses and for other purposes. Public, No. 164. June 4.

H. R. 12281. Making appropriations for the support of the Army for the fiscal year ending June 30, 1919. Public, No. 193. July 9.

H. R. 12402. To exclude and expel from the United States aliens who are members of the anarchistic and similar classes. Public, No. 221. Oct. 16.

H. R. 12580. To authorize an additional issue of bonds to meet expenditures for the national security and defense, and for the purpose of assisting in the prosecution of the war, to extend national credit to foreign governments, and for other purposes. Public, No. 192. July 9.

H. R. 12599. Making appropriations for the service of the Post Office Department for the fiscal year ending June 30, 1919, and for other purposes. Public, No. 185. July 2.

H. R. 12714. Making appropriations for the Department of Agriculture for the fiscal year ending June 13, 1919. Public, No. 219. Oct. 1, 1918.

H. R. 12731. Amending the Act entitled "An Act to authorize the President to increase temporarily the Military Establishment of the United States," approved May 18, 1917. Public, No. 210. Aug. 31.

H. R. 12923. To supplement the Second Liberty Bond Act, as amended, and for other purposes. Public, No. 217. Sept. 24.

H. R. 12976. Providing for the protection of the users of the telephone and telegraph service and the properties and funds belonging thereto during the Government operation and control. Public, No. 230. Oct. 29.

H. R. 13086. Making appropriations to supply deficiencies in appropriations for the fiscal year ending June 30, 1919, and prior fiscal years, on account of war expenses, and for other purposes. Public, No. 233. Nov. 4.

H. J. Res. 255. Authorizing the readmission to the United States of the aliens who have been conscripted or have volunteered for service with the military forces of the United States or cobelligerent forces. Public Res., No. 34. June 29.

H. J. Res. 309. To authorize the President, in time of war, to supervise or take possession and assume control of any telegraph, telephone, marine cable, or radio system or systems or any part thereof and to operate the same in such manner as may be needful or desirable for the duration of the war, and to provide just compensation therefor. Public Res., No. 38. July 16.

H. J. Res. 333. To aid in combating "Spanish Influenza" and other communicable diseases. Public Res. No. 42. Oct. 1.

Third Session.—The third and final session of the Sixty-fifth Congress opened on Dec. 2 (see I, *The Sixty-fifth Congress*). Because of absence of the President in Europe, no measures were enacted before the end of the year.

Appropriations.—A summary of the appropriations of the Sixty-fifth Congress at its second session for the fiscal year 1919 is given in the accompanying table; in addition contracts were authorized to the amount of $9,027,441,362, making the total of appropriations and contract authorizations $36,119,536,082.75.

RECAPITULATION OF APPROPRIATIONS, 1918–19.

REGULAR ACTS

Agriculture	$27,875,352.00
Army	10,225,478,312.91
Diplomatic and Consular	7,937,376.66
District of Columbia [1]	15,046,768.66
Fortification	2,814,348,267.85
Indian	11,021,910.00
Legislative, etc	69,937,863.25
Military Academy	2,515.005.01
Naval	1,573,468,415.84
Pension	220,050,000.00
Post Office [2]	377,573,342.00
River and harbor	23,771,900.00
Sundry civil	2,019,654,470.07
Total, regular acts	$17,388,678,985.25

DEFICIENCY ACTS

Urgent deficiency, 1918	$731,901,789.46
Additional urgent deficiency, 1918	90,700,022.62
Deficiency, 1918	1,015,406,732.34
First deficiency, 1919	2,487,003,912.41
Total, deficiency acts	$4,325,012,456.83

MISCELLANEOUS ACTS

Congress, expenses of	$266,000.00
Federal land-bank bonds, purchase of	200,000,000.00
Federal operation of railroads	500,000,000.00
Loans to our allies by the third and fourth Liberty bond acts [3]	3,000,000,000.00
War Finance Corporation and Capital Issues Committee	500,200,000.00
Indianhead, Md., Naval Proving Ground, transportation system	1,000,000.00
Naturalization of aliens in the Army and Navy	400,000.00
Vocational rehabilitation of soldiers and sailors	2,000,000.00
Greece, payment to, for injuries of nationals	40,000.00
Combating Spanish influenza and other communicable diseases	1,000,000.00
Encouraging production and regulation of ores, metals, and minerals	50,500,000.00
Boston, Mass., dry dock for Navy, purchase of	4,550,000.00
Public Health Service, addition to Hygienic Laboratory	
Encouraging production, etc., and distribution of food products	11,031,863.00
Total, miscellaneous acts	$4,270,987,863.00

PERMANENTS AND INDEFINITES

Interest on the public debt [4]	$655,107,269.00
Sinking fund [4]	288,889,865.00
Preparation and issuance of loans, expenses of [4]	39,732,306.67
Increased compensation to Government employees [5]	51,946,030.00
Miscellaneous permanents and indefinites [6]	71,739,945.00
Total, permanents and indefinites	$1,107,415,415.67
Grand total	$27,092,094,720.75

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[1] One-half of the amounts for the District of Columbia payable by the United States, except amounts for the water service (estimated for 1919 at $683,000), which are payable from the revenues of the water department.

[2] The expenses of the Postal Service are payable from postal revenues to the extent they are sufficient therefor and the remainder is paid out of the Treasury.

[3] Reimbursable by foreign governments to whom advancements are made.

[4] Revised estimate for 1919 as submitted by the Secretary of the Treasury in his annual report for the fiscal year 1918.

[5] This sum is approximated and includes $25,000,000 for increases authorized by the legislative, etc., act and $26,946,030 authorized by the Post Office act. The latter sum is in addition to $13,053,970 definitely appropriated in that act for that purpose.

[6] Approximated.

IV. THE NATIONAL ADMINISTRATION

THE SIXTY-SIXTH CONGRESS

The Senate.—The terms of 32 Senators expire on March 3, 1919. Their successors were elected on Nov. 5, 1918. The following is a complete list of the members of the Senate in the Sixty-sixth Congress:

THE SENATE

Republicans in *Italic*, 50; Democrats in Roman, 46; whole number, 96. Salary, $7,500 per year and mileage of 20 cents per mile each way. Those marked * reëlected in 1918. Terms expire in years indicated.

Alabama
1921. Oscar W. Underwood
1925. J. H. Bankhead *

Arizona
1921. Marcus A. Smith
1923. Henry F. Ashurst

Arkansas
1921. Wm. F. Kirby
1925. Jos. T. Robinson *

California
1921. James D. Phelan
1923. *Hiram W. Johnson*

Colorado
1921. Chas. S. Thomas
1925. *Lawrence C. Phipps*

Connecticut
1921. *F. B. Brandegee*
1923. *George P. McLean*

Delaware
1923. J. O. Wolcott
1925. *L. Heisler Ball*

Florida
1921. Duncan U. Fletcher
1923. Park Trammell

Georgia
1921. Hoke Smith
1925. Wm. J. Harris

Idaho
1921. John F. Nugent
1925. *Wm. E. Borah* *

Illinois
1921. *L. Y. Sherman*
1925. *Medill McCormick*

Indiana
1921. *James E. Watson*
1923. *Harry S. New*

Iowa
1921. *A. B. Cummins*
1925. *Wm. S. Kenyon* *

Kansas
1921. *Charles Curtis*
1919. *Arthur Capper*

Kentucky
1921. J. C. W. Beckham
1925. Aug. O. Stanley

Louisiana
1921. Edward J. Gay
1925. Jos. E. Ransdell *

Maine
1919. *Bert M. Fernald*
1923. *Frederick Hale*

Maryland
1921. John W. Smith
1923. *J. I. France*

Massachusetts
1923. *Henry Cabot Lodge*
1925. David I. Walsh

Michigan
1923. *Chas. E. Townsend*
1925. *Truman H. Newberry*

Minnesota
1923. *Frank S. Kellogg*
1925. *Knute Nelson* *

Mississippi
1923. John S. Williams *
1925. B. P. Harrison

Missouri
1921. *Selden P. Spencer*
1923. James A. Reed

Montana
1923. Henry L. Myers
1925. Thos. J. Walsh *

Nebraska
1923. G. M. Hitchcock
1925. *Geo. W. Norris* *

Nevada
1921. *Chas. B. Henderson*
1923. Key Pittman

New Hampshire
1921. *George H. Moses*
1925. *Henry W. Keyes*

New Jersey
1923. *J. S. Frelinghuysen*
1925. *Walter E. Edge*

New Mexico
1923. A. A. Jones
1925. *Albert B. Fall* *

New York
1921. *Jas. W. Wadsworth*
1923. *Wm. M. Calder*

North Carolina
1921. Lee S. Overman
1925. F. M. Simmons *

North Dakota
1921. *Asle J. Gronna*
1923. *P. J. McCumber*

Ohio
1921. *Warren G. Harding*
1923. Atlee Pomerene

Oklahoma
1921. Thomas P. Gore
1925. Robert L. Owen *

Oregon
1921. G. E. Chamberlain
1925. *Chas. L. McNary* *

Pennsylvania
1921. *Boies Penrose*
1923. *Philander C. Knox*

Rhode Island
1923. Peter G. Gerry
1925. *LeBaron B. Colt* *

South Carolina
1921. Ellison D. Smith
1925. W. P. Pollock

South Dakota
1921. Ed. S. Johnson
1925. *Thomas Sterling* *

Tennessee
1923. K. D. McKellar
1925. John K. Shields *

Texas
1923. Chas. A. Culberson
1925. Morris Sheppard *

Utah
1921. *Reed Smoot*
1923. Wm. H. King

Vermont
1921. *W. P. Dillingham*
1923. *Carroll S. Page*

Virginia
1923. Claude A. Swanson
1925. Thomas S. Martin *

Washington
1921. *Wesley L. Jones*
1923. *Miles Poindexter*

West Virginia
1923. *Howard Sutherland*
1925. *Davis Elkins*

Wisconsin
1921. *Irvine L. Lenroot*
1923. *R. M. La Follette*

Wyoming
1923. John B. Kendrick
1925. *F. E. Warren* *

House of Representatives.—The following list of members of the House of Representatives in the Sixty-sixth Congress, though unofficial, is compiled by the clerk of the House of Representatives.

HOUSE OF REPRESENTATIVES

Republicans in *Italic*, 238; Democrats in Roman, 193; Independent in CAPS, 2; Socialist in *ITALIC CAPS*, 1; Prohibitionist in Small Caps, 1; whole number 435. Those marked * served in the 65th Congress. Salary $7,500 per annum and mileage of 20 cents per mile.

Alabama

1. John McDuffie
2. S. H. Dent *
3. H. B. Steagall *
4. F. L. Blackmon *
5. J. T. Heflin *
6. W. B. Oliver *
7. J. L. Burnett *
8. E. B. Almon *
9. George Huddleston *

at large—W. B. Bankhead *

Arizona

at large—Carl Hayden *

Arkansas

1. T. H. Caraway *
2. W. A. Oldfield *
3. J. N. Tillman *
4. O. T. Wingo *
5. H. M. Jacoway *
6. S. M. Taylor *
7. W. S. Goodwin *

California

1. Clarence F. Lea *
2. J. E. Raker *
3. *C. F. Curry* *
4. *Julius Kahn* *
5. *J. I. Nolan* *
6. *J. A. Elston* *
7. *H. E. Barbour*
8. H. S. Hersman
9. C. H. Randall *
10. *Henry Z. Osborne* *
11. William Kettner *

Colorado

1. *Wm. N. Vaile*
2. *Chas. B. Timberlake* *
3. *Guy W. Hardy*
4. Edward T. Taylor *

Connecticut

1. Augustine Lonergan *
2. *R. P. Freeman* *
3. *J. Q. Tilson* *
4. *S. Merritt* *
5. *J. P. Glynn* *

Delaware

at large—*C. R. Layton*

Florida

1. Herbert J. Drane *
2. Frank Clark *
3. J. H. Smithwick
4. W. J. Sears *

Georgia

1. J. W. Overstreet *
2. Frank Park *
3. C. R. Crisp *
4. W. C. Wright *
5. Wm. D. Upshaw
6. Jas. W. Wise *
7. Gordon Lee *
8. C. H. Brand *
9. Thomas M. Bell *
10. Carl Vinson *
11. W. C. Lankford
12. W. W. Larsen *

Idaho

1. *Burton L. French* *
2. *A. T. Smith* *

Illinois

1. *M. B. Madden* *
2. *J. R. Mann* *
3. *W. W. Wilson* *
4. John W. Rainey *
5. A. J. Sabath *
6. James McAndrews *
7. *Niels Juul* *
8. Thomas Gallagher *
9. *F. A. Britten* *
10. *C. A. Chindblom*
11. *I. C. Copley* *
12. *C. E. Fuller* *
13. *J. C. McKenzie* *
14. *Wm. J. Graham* *
15. *E. J. King* *
16. *Clifford Ireland* *
17. *Frank L. Smith*
18. *J. G. Cannon* *
19. *W. B. McKinley* *
20. H. T. Rainey *
21. *L. E. Wheeler* *
22. *W. A. Rodenberg* *
23. *E. B. Brooks*
24. *T. S. Williams* *
25. *E. E. Denison* *

at large—*Wm. E. Mason*,* *Richard Yates*

Indiana

1. *O. R. Luhring*
2. *Oscar E. Bland* *
3. *J. W. Dunbar*
4. *J. S. Benham*
5. *Everitt Sanders* *
6. *R. N. Elliott* *
7. *Merrill Moores* *
8. *Albert H. Vestal* *
9. *F. S. Purnell* *
10. *W. R. Wood* *
11. *Milton Kraus* *
12. *L. W. Fairfield* *
13. *A. J. Hickey*

Iowa

1. *C. A. Kennedy* *
2. *H. E. Hull* *
3. *B. E. Sweet* *
4. *G. N. Haugen* *
5. *J. W. Good* *
6. *C. W. Ramseyer* *
7. *C. C. Dowell* *
8. *H. M. Towner* *
9. *W. R. Green* *
10. *J. L. Dickinson*
11. *W. D. Boies*

Kansas

1. *D. R. Anthony, Jr.**
2. *Edward C. Little* *
3. *P. P. Campbell* *
4. *Homer Hoch*
5. *Jas. G. Strong*
6. *Hayes B. White*
7. *J. N. Tincher*
8. W. A. Ayres *

Kentucky

1. A. W. Barkley *
2. D. H. Kincheloe *
3. R. Y. Thomas, Jr.*
4. Ben Johnson *
5. *Chas. F. Ogden*
6. A. B. Rouse *
7. J. C. Cantrill *
8. Harvey Helm *
9. W. J. Fields *
10. *J. W. Langley* *
11. *J. M. Robison*

Louisiana

1. Albert Estopinal *
2. H. G. Dupré *
3. W. P. Martin *
4. J. T. Watkins *
5. Riley J. Wilson *
6. J. Y. Sanders *
7. L. Lazaro *
8. James B. Aswell *

Maine

1. *Louis Goodall* *
2. *Wallace H. White* *
3. *John A. Peters* *
4. *Ira G. Hersey* *

Maryland

1. *Wm. N. Andrews*
2. C. D. Benson
3. C. P. Coady *
4. J. C. Linthicum *
5. *S. E. Mudd* *
6. *F. N. Zihlman* *

Massachusetts

1. *A. T. Treadway* *
2. *F. H. Gillett* *
3. *C. D. Paige* *
4. *S. E. Winslow* *
5. *J. J. Rogers* *
6. *W. W. Lufkin* *
7. M. F. Phelan *
8. *F. W. Dallinger* *
9. *Alvan T. Fuller* *
10. John F. Fitzgerald
11. *G. H. Tinkham* *
12. J. A. Gallivan *
13. *Robert Luce*
14. Richard Olney, 2d *
15. *W. S. Greene* *
16. *Joseph Walsh* *

Michigan

1. F. E. Doremus *
2. _E. C. Michener_
3. _J. M. C. Smith_ *
4. _E. L. Hamilton_ *
5. _C. E. Mapes_ *
6. _P. H. Kelley_ *
7. _L. C. Cramton_ *
8. _J. W. Fordney_ *
9. _J. C. McLaughlin_ *
10. _G. A. Currie_ *
11. _F. D. Scott_ *
12. _W. F. James_ *
13. _C. A. Nichols_ *

Minnesota

1. _Sydney Anderson_ *
2. _F. F. Ellsworth_ *
3. _C. R. Davis_ *
4. C. C. Van Dyke *
5. W. _H. Newton_
6. _Harold Knutson_ *
7. _A. J. Volstead_ *
8. W. L. CARRS
9. _Halvor Steenerson_ *
10. _Thomas D. Schall_ *

Mississippi

1. E. S. Candler *
2. H. D. Stephens *
3. B. G. Humphreys *
4. T. U. Sisson *
5. W. W. Venable *
6. P. B. Johnson
7. P. E. Quin *
8. J. W. Collier *

Missouri

1. Milton A. Romjue *
2. W. W. Rucker *
3. J. W. Alexander *
4. C. F. Booher *
5. W. P. Bland
6. C. C. Dickinson *
7. Sam C. Major
8. Wm. L. Nelson
9. Champ Clark *
10. _Cleveland Newton_
11. W. L. Igoe *
12. _L. C. Dyer_ *
13. _M. E. Rhodes_
14. _E. D. Hays_
15. _J. V. McPherson_
16. T. L. Rubey *

Montana

AT LARGE—J. M. Evans,* _C. W. Riddick_

Nebraska

1. _C. F. Reavis_ *
2. _A. W. Jefferies_
3. _Robt. E. Evans_
4. _M. O. McLaughlin_
5. _Wm. E. Andrews_
6. _M. P. Kinkaid_ *

Nevada

AT LARGE—Chas. R. Evans

New Hampshire

1. _S. E. Burroughs_ *
2. _E. H. Wason_ *

New Jersey

1. _W. J. Browning_ *
2. _Isaac Bacharach_ *
3. T. J. Scully *
4. _E. C. Hutchinson_ *
5. _E. R. Ackerman_
6. _John R. Ramsey_ *
7. _A. H. Radcliffe_
8. C. J. McGlennon
9. D. F. Minahan
10. _Fred R. Lehlbach_ *
11. J. J. Eagan *
12. J. A. Hamill *

New Mexico

AT LARGE—_B. C. Hernandez_

New York

1. _Fred. C. Hicks_ *
2. C. P. Caldwell *
3. _John McCrate_
4. Thos. H. Cullen
5. J. B. Johnston
6. _F. W. Rowe_ *
7. Jas. P. Maher *
8. Wm. E. Cleary *
9. D. J. O'Connell
10. _R. L. Haskell_ *
11. D. J. Riordan *
12. H. M. Goldfogle
13. C. D. Sullivan *
14. _F. H. La Guardia_ *
15. P. J. Dooling *
16. Thos. F. Smith *
17. H. C. Pell
18. John F. Carew *
19. Joseph Rowan
20. _Isaac Siegel_ *
21. J. F. Donovan *
22. A. J. Griffin *
23. R. F. McKiniry
24. Jas. V. Ganly
25. _J. W. Husted_ *
26. _Edmund Platt_ *
27. _C. B. Ward_ *
28. _R. B. Sanford_ *
29. _J. S. Parker_ *
30. _Frank Crowther_
31. _B. H. Snell_ *
32. _L. W. Mott_ *
33. _H. P. Snyder_ *
34. _Wm. H. Hill_
35. _W. W. Magee_ *
36. _N. J. Gould_ *
37. _A. B. Houghton_
38. _T. B. Dunn_ *
39. _A. D. Sanders_ *
40. _S. W. Dempsey_ *
41. _Clarence MacGregor_
42. James M. Mead
43. _Daniel Reed_

North Carolina

1. J. H. Small *
2. Claude Kitchin *
3. S. M. Brinson
4. E. W. Pou *
5. C. M. Stedman *
6. H. L. Godwin *
7. L. D. Robinson *
8. R. L. Doughton *
9. E. Y. Webb *
10. Zebulon Weaver *

North Dakota

1. _J. M. Baer_ *
2. _G. M. Young_ *
3. _J. H. Sinclair_

Ohio

1. _Nicholas Longworth_ *
2. _A. E. B. Stephens_
3. Warren Gard *
4. B. F. Welty *
5. _C. J. Thompson_
6. _C. C. Kearns_ *
7. _S. D. Fess_ *
8. _R. Clint Cole_
9. I. R. Sherwood *
10. _I. M. Foster_
11. _E. D. Ricketts_
12. C. L. Brumbaugh *
13. _J. T. Begg_
14. M. L. Davey
15. _C. Ellis Moore_
16. _R. C. McCulloch_ *
17. W. A. Ashbrook *
18. _B. F. Murphy_
19. _J. G. Cooper_ *
20. Chas. A. Mooney
21. John J. Babka
22. _H. I. Emerson_ *

Oklahoma

1. E. B. Howard
2. W. W. Hastings *
3. C. D. Carter *
4. T. D. McKeown *
5. J. B. Thompson *
6. Scott Ferris *
7. J. V. McClintic *
8. _D. T. Morgan_ *

Oregon

1. _W. C. Hawley_ *
2. _N. J. Sinnott_ *
3. _C. N. McArthur_ *

Pennsylvania

1. _W. S. Vare_ *
2. _G. S. Graham_ *
3. _J. H. Moore_ *
4. _G. W. Edmonds_ *
5. _P. E. Costello_ *
6. _G. P. Darrow_ *
7. _T. S. Butler_ *
8. _H. W. Watson_ *
9. _W. W. Griest_ *
10. Patrick McLane
11. John J. Casey
12. _John Reber_
13. A. G. Dewalt *
14. _L. T. McFadden_ *
15. _E. R. Kiess_ *
16. J. V. Lesher *
17. _B. K. Focht_ *
18. _A. S. Kreider_ *
19. _John M. Rose_ *
20. _E. S. Brooks_
21. _Evan J. Jones_
22. _Edwin E. Robbins_
23. _S. A. Kendall_
24. _H. W. Temple_ *
25. M. M. Shreve
26. H. J. Steele *
27. _Nathan L. Strong_ *
28. _W. J. Hulings_
29. _S. G. Porter_ *
30. M. CLYDE KELLY *
31. _J. M. Morin_ *
32. Guy E. Campbell *

AT LARGE—_T. S. Crago_,* _M. M. Garland_,* _Wm. J. Burke_, _A. H. Walters_

Rhode Island

1. _Clark Burdick_
2. _W. R. Stiness_ *
3. _Ambrose Kennedy_ *

South Carolina

1. R. S. Whaley *
2. J. F. Byrnes *
3. F. H. Dominick *

4. S. J. Nicholls *
5. W. F. Stevenson *
6. J. W. Ragsdale *
7. A. F. Lever *

South Dakota

1. *C. Christopherson*
2. *R. C. Johnson* *
3. H. L. Gandy *

Tennessee

1. *S. R. Sells* *
2. *J. Will Taylor*
3. J. A. Moon *
4. Cordell Hull *
5. E. L. Davis
6. J. W. Byrns *
7. L. P. Padgett *
8. T. W. Sims *
9. F. J. Garrett *
10. Hubert Fisher *

Texas

1. Eugene Black *
2. John C. Box
3. James Young *
4. Sam Rayburn *
5. H. W. Sumners *
6. Rufus Hardy *
7. Clay S. Briggs
8. J. H. Eagle *
9. J. J. Mansfield *
10. J. P. Buchanan *
11. Thomas Connally *
12. James C. Wilson *
13. L. W. Parrish
14. Carlos Bee
15. J. N. Garner *
16. Claude Hudspeth
17. Thos. L. Blanton
18. Marvin Jones *

Utah

1. Milton H. Welling *
2. J. H. Mays *

Vermont

1. *F. L. Greene* *
2. *P. H. Dale* *

Virginia

1. S. O. Bland
2. E. E. Holland *
3. A. J. Montague *
4. W. A. Watson *
5. E. W. Saunders *
6. Carter Glass *
7. T. W. Harrison *
8. C. C. Carlin *
9. *C. B. Slemp* *
10. H. D. Flood *

Washington

1. *John F. Miller* *
2. *L. H. Hadley* *
3. *A. Johnson* *
4. *J. W. Summers*
5. *J. S. Webster*

West Virginia

1. M. M. Neely *
2. *George M. Bowers* *
3. *Stuart F. Reed* *
4. *H. C. Woodyard* *
5. *Wells Goodykoountz*
6. *L. B. Echols*

Wisconsin

1. *C. E. Randell*
2. *Edward Voigt* *
3. *J. G. Monahan*
4. *John C. Kaetska*
5. *VICTOR BERGER*
6. *Florian Lampert*
7. *J. J. Esch* *
8. *E. E. Browne* *
9. *David G. Classon* *
10. *J. A. Frear* *
11. *A. P. Nelson*

Wyoming

AT LARGE—*F. W. Mondell* *

THE FEDERAL JUDICIARY

The United States Supreme Court.—Supreme Court justices are appointed for life and receive salaries of $14,500 per year, except the Chief Justice, whose salary is $15,000. The justices of the Supreme Court are:

	Born	App.
Edward D. White, La., Chief Justice	1845	1894
Joseph McKenna, Cal.	1843	1898
Oliver W. Holmes, Mass.	1841	1902
William R. Day, Ohio	1849	1903
Willis Van Devanter, Wyo.	1859	1910
Mahlon Pitney, N. J.	1858	1912
James C. McReynolds, Tenn.	1862	1914
Louis D. Brandeis, Mass.	1856	1916
John H. Clarke, Ohio	1857	1916
Clerk, James D. Maher, D. C.		$6,000
Marshal, Frank Key Green		4,500
Reporter, Ernest Knaebel, Col.		4,500

United States Circuit Courts of Appeals.—The Act of March 3, 1911 (*A. Y. B.*, 1912, p. 231), provides that there shall be in each judicial circuit a Circuit Court of Appeals, which shall consist of three judges, two of whom shall constitute a quorum; the Chief Justice and the associate justices of the Supreme Court assigned to each circuit, and the several district judges within each circuit, shall be competent to sit therein, in addition to the judges of the circuit courts abolished in 1912. There were 32 circuit judges on Dec. 31, 1918, with one vacancy in the Seventh Circuit. The salary of circuit judges is $7,000.

United States District Courts.—The judicial districts into which the United States is divided were enumerated in the Year Book for 1913 (p. 175). On Dec. 31, 1918, there were 96 district judges in the United States, exclusive of the non-contiguous territories (salary $6,000). There are four U. S. district judges in Alaska, two in Hawaii, one in Porto Rico, and one in the Canal Zone.

Court of Claims.—Claims against the United States are adjudicated by a Court of Claims consisting of five judges appointed for life or during good behavior, the Chief Justice receiving a salary of $6,500 and the associated judges of $6,000. The Court is now constituted as follows:

Chief Justice.—Edward K. Campbell, appointed 1913.
Judges.—Fenton W. Booth, appointed 1897.
Samuel S. Barney, appointed 1906.
George E. Downey, appointed 1915.
James Hay, appointed 1916.

Court of Customs Appeals.—The Court of Customs Appeals, created by the tariff act of 1909, is constituted as follows:

Presiding Judge.—Robert M. Montgomery, Michigan.
Associate Judges.—James F. Smith, California; Orion M. Barber, Vermont; Marion De Vries, California; George E. Martin, Ohio.

IV. THE NATIONAL ADMINISTRATION

THE DIPLOMATIC SERVICE

	ACCREDITED BY UNITED STATES		ACCREDITED TO UNITED STATES	
			AMBASSADORS	
Country		Appointed		Commissioned
Argentina	Frederic Jesup Stimson	1914	Rómulo S. Naón	1912
Austria-Hungary	—— ——		—— ——	
Brazil	Edwin V. Morgan	1912	Domicio da Gama	1911
Chile	Joseph H. Shea	1916	—— ——	
France	William G. Sharp	1914	J. J. Jusserand	1903
Germany	—— ——		—— ——	
Great Britain	John W. Davis	1918	Earl of Reading	1918
Italy	Thomas N. Page	1913	Count V. Macchi di Celliere	1914
Japan	Roland S. Morris	1917	Viscount Kikujiro Ichii	1918
Mexico	Henry P. Fletcher	1915	Señor Ing. Ygnacio Bonillas	1917
Russia	David R. Francis	1916	Boris Bakhméteff	1911
Spain	Joseph E. Willard	1913	Señor Don Juan Riaño y Gayangos	1910
Turkey	—— ——		—— ——	
			MINISTERS PLENIPOTENTIARY	
Belgium	Brand Whitlock	1913	E. de Cartier de Marchienne	1917
Bolivia	—— ——		Señor Don Ignacio Calderon	1904
Bulgaria	Charles J. Vopicka	1917	Stephan Panaretoff	1915
China	Paul S. Reinsch	1913	V. K. Wellington Koo	1915
Colombia	Hoffman Philip	1917	Dr. Carlos Adolfo Urueta	1917
Costa Rica	Edward J. Hale	1913	—— ——	
Cuba	William E. Gonzales	1913	Dr. Carlos Manuel de Céspedes	1914
Denmark	—— ——		Constantin Brun	1917
Dominican Republic	William W. Russell	1915	Dr. Louis Galván	1917
Ecuador	Charles S. Hartman	1913	Señor Dr. Don R. H. Elizalde	1917
Greece	Garrett Droppers	1914	Georges Roussos	1917
Guatemala	William H. Leavell	1913	Señor Don Joaquin Méndes	1912
Haiti	Arthur Bailly-Blanchard	1914	Solon Ménos	1914
Honduras	T. Sambola Jones	1918	Señor Don J. A. L. Gutierrez	1918
Montenegro	Garrett Droppers	1914	Antoine Gvosdenovitch	1918
Netherlands	John W. Garrett	1917	J. Theodore Cramer	1918
Nicaragua	Benjamin L. Jefferson	1913	Señor Don Diego M. Chamorro	1918
Norway	Albert J. Schmedemann	1913	H. H. Bryn	1910
Panama	William J. Price	1913	Señor Dr. Don Belisario Porras	1917
Paraguay	Daniel F. Mooney	1914	Dr. Manuel Gondra	1918
Persia	John L. Caldwell	1914	—— ——	
Peru	Benton McMillan	1913	Manuel de Freyre y Santander	1916
Portugal	Thomas H. Birch	1913	Viscount de Alte	1902
Rumania	Charles J. Vopicka	1913	—— ——	
Salvador	Boaz W. Long	1914	Señor Dr. Don Rafael Zaldivar	1915
Serbia	Charles J. Vopicka	1913	—— ——	
Siam	—— ——		Phya Prabha Karavongse	1914
Sweden	Ira Nelson Morris	1914	W. A. F. Ekengren	1911
Switzerland	Pleasant A. Stovall	1913	Dr. Hans Sulzer	1917
Uruguay	Robert E. Jeffery	1915	Dr. Carlos Maria de Pena	1911
Venezuela	Preston McGoodwin	1913	Señor Don Santos A. Dominici	1914

THE CONSULAR SERVICE

By Act of Congress of Feb. 5, 1915, it is provided that consuls-general and consuls will hereafter be appointed with the advice and consent of the Senate to grades and classes of the Service and not to particular posts. They will receive commissions as officers of specific classes and may be assigned by the President to posts of duty as the interest of the Service may require, and may be transferred by the President from one post to another as he may deem it necessary.

Consuls-general and consuls are graded, classified and compensated as follows:

Consuls-General		*Consuls*	
Class one,	$12,000	Class one	$8,000
Class two,	8,000	Class two,	6,000
Class three,	6,000	Class three,	5,000
Class four,	5,500	Class four,	4,500
Class five,	4,500	Class five,	4,000
		Class six,	3,500
		Class seven,	3,000
		Class eight,	2,500
		Class nine,	2,000

There are in all 49 consuls-general and 272 consuls stationed in the principal cities of the various countries of the world with which the United States maintains diplomatic relations. In addition there are 128 consular agents who are subordinate to the principal consular officers.

CIVIL SERVICE

Clinton Rogers Woodruff

Federal Civil Service.—The merit system of appointments was maintained through the war in the Federal service, although it was a period of greatly increased activity in appointments. In the year ended June 30, 1918, 551,391 persons were examined, of whom 214,567 were appointed. The U. S. Civil Service Commission with its widespread organization coöperated effectively with the departments, thus reducing waste and confusion and insuring the appointments of persons best qualified to serve the Government. The abnormal demand for additional employees which began in 1917 continued through 1918, when there was an increase of 161 per cent. over the number examined and an increase of 150 per cent. in the number appointed.

There has been an increasing observance of the Federal Civil Service Act and rules. The Act contemplates the necessity of occasional exceptions, but all such are now substantially confined to positions for which competition would be impracticable, and the application of the fundamental principles laid down in the Act has been made uniform throughout the service. Notwithstanding the tremendous demand of the Government service, the merit system of appointments has been fully maintained in all the older branches. Some new agencies have been permitted by acts of Congress or executive orders to make appointments without reference to the registers of eligibles. Some positions have been filled on non-competitive examination because of the evident insufficiency of the number of qualified persons offering to compete. All appointees were required to meet tests of fitness determined in advance. This individual rating developed the coöperation of the departments in recruiting applicants who were assured of appointment if qualified. It also expedited the filling of vacancies. Less than two appointments in every thousand were made upon non-competitive tests.

The proportion of women in the service has greatly increased. The examinations are open to them upon the same requirements and conditions and with the same compensations prescribed for men. No discrimination on account of sex is made in the Civil Service Act and rules. Whatever inequalities arise are occasioned by the requirements of the service in the judgment of appointing officers and not from any restrictive action of the Commission. Women are occupying not only a much larger proportion of positions in the service, but have secured increased recognition in promotion to higher positions formerly largely filled by men. In the fiscal year 1918, 137,620 women were examined, as compared with 25,457 in the year previous, an increase of 441 per cent., whereas the increase of men was only 122 per cent.

There has never been a uniform entrance salary for any given character of work. Disparities have become greater under lump-sum appropriations created by war exigencies vesting discretion in different departments as to rates of pay. This has permitted them to bid against each other by offering higher salaries, not merely to eligibles on the register, but to persons already in the service. So serious was this condition of competition that the President issued executive orders for its prevention.

Inequalities in salaries and failure to adjust pay to the work performed by employees occasioned an increasing percentage of declinations of appointments and of registrations, rising recently in Washington to more than 5,000 employees a month, or nearly six per cent. in a force of 85,000. This excessive turnover and loss of training throw an increased burden upon the older and experienced employees and compel the appointment of a much larger number of persons than would be necessary under a systematic regulation of pay to duties.

The chaotic salary conditions make it impossible to secure an equitable system of promotion. Each department is practically an independent unit with its separate appropriations, exercising a large measure of discretion and control over the duties, qualifications and compensation of its employees, some being liberal and others conservative in fixing salaries. Where aggregate sums are appropriated to be distributed by the appointing officer at discretion, the number of titles and rates of pay become indefinitely varied and a lack of uniformity arises among the several departments and in offices in the same department.

More effectively to meet war needs in supplying eligibles, the Commission made certain changes in its method of certification. Certification for appointment in peace times was made of those standing highest in the examinations from the states which at the time had received the least share of appointments. Since the war began, however, the shares of appointments already received by the states have not in all cases controlled the order of certification, the highest being certified without regard to disparities in the apportionment of appointments received by the respective states. All those appointed are nevertheless charged to the apportionment and those separated are credited.

About nine-tenths of the positions in the classified service are outside of Washington in what is called the field service, including the Canal Zone, Porto Rico, Hawaii and the Philippines. There are not far from half a million such positions. Nearly all of these field positions are dealt with by the Commission through the offices of its 12 district secretaries. During the fiscal year there were 177,609 appointments made through these secretaries, an increase of more than 126 per cent. over the preceding year.

On March 31 Postmaster Burleson declared his intention to give his four assistants a full civil-service status, so that their places may be open to competition and promotion from the ranks below. The adoption of this recommendation, set forth in his annual report, would place virtually the whole Post Office Department, with the exception of the Postmaster-General himself, under merit rule. The report said:

> In the interest of public service the positions of Assistant Postmasters-General and the purchasing agent of this Department should be included in the civil service, and it is urgently recommended that Congress enact legislation granting this authority. Then when vacancies occur in these positions they should be filled by men of years of experience in the postal service and who have demonstrated their fitness for appointment to such positions.

Referring to the status of presidential postmasters, Mr. Burleson again recommended legislation placing them under the civil service law. Such a bill passed the House at the previous session of Congress, but was rejected by the Senate.

In the Federal service while there has been no new civil-service legislation and little extension of the merit principle through executive orders since the order of March 31, 1917, requiring competition in the selection of presidential postmasters (*A. Y. B.*, 1917, p. 160) two executive recommendations are of importance: the Postmaster-General's recommendation and that of the Tariff Commission. In a special report on the reorganization of the Customs Service, the latter advises similar treatment for collectors of customs. These groups of employees are among the chief items of political spoils with every change of administration, and the adoption of these suggestions would be a long step forward in the application of the merit system.

During the year there has been a marked decrease in the number of violations of the civil-service rule forbidding undue activity in political affairs reported to the Commission, and only four cases arose under the provisions of the criminal code relating to political assessments. Recognizing the wisdom of restricting political activity of the railroad employees of the Government, the Director-General of Railroads on Aug. 31 and on Oct. 22 issued orders similar to those applying to employees in the ordinary civil service.

Warning against the danger that the vast body of employees of the railroads, telegraphs, telephones and express companies, now under Government control, may be subjected to political manipulation, the National Civil Service Reform League through its Executive Committee called public attention to the grave danger to popular institutions existing in the administration of railways, express companies, telegraphs, telephones and other industries if carried on by the Government through political agencies by means of appointments made on the discretionary authority of a Cabinet officer without reference to the civil-service system. It did not question the necessity of Government control of these industries during the war, nor the purposes of the present Cabinet officers who were administering them, but called attention to the fact that

> the spoils system, which has now been in the main so happily eliminated from the Federal civil service, was due to the same conditions as now prevail in these industries; to wit, discretionary appointments and political control. When the war ceases and places in the service become highly desirable, it is inevitable that they will be sought and granted by political methods, unless this service is now protected by a system which will render patronage impossible as long as these industries remain under Government control. Otherwise there will be created a vast political machine, embracing nearly 2,000,000 subordinates and used for the purpose of controlling elections and probably for influencing the future status of these industries. This will be pregnant with disaster to free institutions.

In view of the augmentation of the military service, the extent to which preference in appointment and reinstatement should be granted to the returning soldier is of great importance. A statute provides for the reinstatement of former postal employees upon their discharge from military service. On July 18 the President issued an order permitting reinstatement of classified employees for five years after their discharge from the military service in the war with Germany. Many suggestions have been made for granting preference in appointment to veterans. The Federal Commission believes that preference in appointment should be granted to persons who are entitled to benefit under Article III of the amendment of Oct. 6, 1917, of the War Risk Insurance Act, and who are suffering from disability resulting from personal injury or disease contracted in the line of duty during the war, and that all examinations should be open to them and that they should be released from all requirements respecting age and physical condition, and their appointments when reached in the order of their examination grades should be compulsory if they are found qualified by the Commission with the advice of the Federal Board for Vocational Education to render effective service.

The National Civil Service Reform League brought to public attention the iniquitous provisions of the Census bill which passed the House without civil-service safeguards and is now awaiting action by the Senate. A pamphlet issued by the League made a strong case against the bill, under which the entire census force of almost 100,000 will be subject to the spoils system except 15 statistical experts and four stenographers. Section 9 of the bill provides that the supervisors shall be appointed by the Secretary of Commerce upon the recommendation of the Director of the Census, no provision being made for competitive examination. The supervisors, to the number of not more than 400, will appoint enumerators to the number of about 85,000. A powerful political weapon appears to be created and past experience indicates that it is likely to be used.

National Assembly of Civil Service Commissions.—The meeting of the National Assembly of Civil Service Commissions held at Milwaukee, June 18-22, was essentially in furtherance of the national programme of preparedness. There were 84 delegates present representing 35 commissions. The experience of England and Canada, no less than our own country, has shown the importance of an effective civil service to meet the vast expansion of governmental activities. The key note of the meeting in this respect was a paper by Major Lewis H. Van Dusen, chief of the Personnel Section of the Ordnance Department, on "Methods of Recruiting the Civil Service in War Time," in which he spoke appreciatively of the services rendered by the Federal Civil Service Commission in supplying the great number and variety of technical experts required in this Department.

A committee of the Assembly, in conjunction with a committee of the National Civil Service Reform League, presented a report upon a standard form of report of annual proceedings to be followed by civil service commissions, the suggestions of which were adopted. It is believed that if commissions generally will follow these it will conduce to a far more thorough presentation of the actual workings of the merit system.

William Gorham Rice of the New York State Commission gave an account of the service record system that has been formulated under a recent act of the legislature for use in the civil service of that state, giving the control of markings on efficiency to the Civil Service Commission.

The following officers were elected: President, John C. Murray, New York City; first vice-president, Ralph L. Peck, Chicago; second vice-president, P. H. Bradley, Los Angeles; third vice-president, J. E. Campbell, Pueblo; executive committee, A. Spiehler, Rochester; William Foran, Ottawa; Peter J. Koehler, Milwaukee; secretary-treasurer, John T. Doyle, Washington, D. C. Rochester, N. Y., was selected for the next meeting.

National Civil Service Reform League. — An investigating committee has been appointed to sit in Washington, under the direction of the Executive Committee, to investigate certain reported abuses in the administration of the civil-service law—notably the report that appointments in the U. S. Employment Service have been made for political purposes and that the methods used in examinations for presidential postmasters are contrary to the executive order of March 31, 1917, etc., and to initiate any other inquiries concerning maladministration that may be reported from time to time, and in all cases to apply suitable remedies, subject to the direction of the president of the Executive Committee. The League has announced its intention to move at once for a thorough reorganization of the Diplomatic and Consular Services, so important in the development of the nation's position as a commercial power. Its programme calls for "making these Services an attractive career," as is the practice in most other countries. At the annual meeting the League held in April, Richard H. Dana, of Boston, was elected president and Arthur R. Kimball, of Waterbury, chairman of the Council. George T. Keyes, 79 Wall Street, New York, was reëlected secretary. The 100th anniversary of the birth of Thomas A. Jenckes, the father of civil service in the United States, was celebrated on Nov. 4.

Miscellaneous. — A Colorado constitutional amendment providing the most rigid merit system ever written into constitutional law was the most striking progress made by civil service reform in 1918. The amendment was initiated by petition after the legislature had persistently repealed or nullified civil-service laws, even one obtained by initiative. It was bitterly opposed by the machines of both parties, in spite of platform endorsements, but was carried by a margin of 19,000 votes through the efforts of the National Civil Service Reform League, which assisted the friends of the amendment with funds and services.

The city of Baltimore adopted a new charter at the same election, the main feature of the new instrument being a sound civil-service reform provision. As in Colorado, the measure was opposed by machine politicians, but was carried by a popular vote of nearly three to one.

Paducah, Ky., adopted an ordinance in which the merit system is a prominent feature. It is reported that because of the application of the merit system to the fire department of Paducah, a reduction will be made in the fire-insurance rates prevailing in that city, a striking demonstration of the increased efficiency resulting from the application of the merit system.

V. STATE AND COUNTY GOVERNMENT

STATE AND COUNTY TABLES

JOHN M. MATHEWS

1. THE STATES OF THE UNION: AREA, POPULATION, AND DATES AND ORDER OF RATIFICATION OR ADMISSION

State	Ratification of Constitution		Area, sq. m.	Population June 1, 1900	Population April 15, 1910	Percentage of Increase 1900-1910	Rank in Population, 1910
New Hampshire	June	21, 1788	9,341	411,588	430,572	4.6	39
Massachusetts	Feb.	6, 1788	8,266	2,805,346	3,366,410	20.0	6
Rhode Island	May	29, 1790	1,248	428,556	542,610	26.6	38
Connecticut	Jan.	9, 1788	4,965	908,420	1,114,756	22.7	31
New York	July	26, 1788	49,204	7,268,894	9,113,614	25.4	1
New Jersey	Dec.	18, 1788	8,224	1,883,669	2,537,167	34.7	11
Pennsylvania	Dec.	12, 1787	45,126	6,302,115	7,665,111	21.6	2
Delaware	Dec.	7, 1787	2,370	184,735	202,322	9.5	46
Maryland	April	28, 1788	12,327	1,188,044	1,294,450	9.0	27
Virginia	June	26, 1788	42,627	1,854,184	2,061,612	11.2	20
North Carolina	Nov.	21, 1789	52,426	1,893,810	2,206,287	16.5	16
South Carolina	May	23, 1788	30,989	1,340,316	1,515,400	13.1	26
Georgia	Jan.	2, 1788	59,265	2,216,331	2,609,121	17.7	10
	Date of Admission						
Vermont	Feb.	18, 1791	9,564	343,641	355,956	3.6	42
Kentucky	June	1, 1792	40,598	2,147,174	2,289,905	6.6	14
Tennessee	June	1, 1796	42,022	2,020,616	2,184,789	8.1	17
Maine	March	3, 1820	33,040	694,466	742,371	6.9	34
Texas	Dec.	29, 1845	265,896	3,048,710	3,896,543	27.8	5
West Virginia	June	20, 1863	24,170	958,800	1,221,119	27.4	28
Ohio	April	30, 1802	41,040	4,157,545	4,767,121	14.7	4
Louisiana	April	8, 1812	48,506	1,381,625	1,656,388	19.9	24
Indiana	Dec.	11, 1816	36,354	2,516,462	2,700,876	7.3	9
Mississippi	Dec.	10, 1817	46,865	1,551,270	1,797,114	15.8	21
Illinois	Dec.	3, 1818	56,665	4,821,550	5,638,591	16.9	3
Alabama	Dec.	14, 1819	51,998	1,828,697	2,138,093	16.9	18
Missouri	March	2, 1821	69,420	3,106,665	3,293,335	6.0	7
Arkansas	June	15, 1836	53,335	1,311,564	1,574,449	66.2	25
Michigan	Jan.	26, 1836	57,980	2,420,982	2,810,173	16.1	8
Florida	March	3, 1845	58,666	528,542	752,619	42.1	33
Iowa	Dec.	28, 1846	56,147	2,231,853	2,224,771	-0.3	15
Wisconsin	May	29, 1848	56,066	2,069,042	2,333,860	12.7	13
California	Sept.	9, 1850	158,297	1,485,053	2,377,549	60.1	12
Minnesota	May	11, 1858	84,682	1,751,394	2,075,708	18.5	19
Oregon	Feb.	14, 1859	96,699	413,536	672,765	62.7	35
Kansas	Jan.	29, 1861	82,158	1,470,495	1,690,949	15.0	22
Nevada	March	21, 1864	110,690	42,335	81,875	93.4	48
Nebraska	Feb.	9, 1867	77,520	1,066,300	1,192,214	11.8	29
Colorado	March	3, 1875	103,948	539.700	799,024	48.0	32
North Dakota	Feb.	22, 1889	70,837	319,146	577,056	80.8	37
South Dakota	Feb.	22, 1889	77,615	401,570	583,888	45.4	36
Montana	Feb.	22, 1889	146,997	243,329	376,053	54.5	40
Washington	Feb.	22, 1889	69,127	518,103	1,141,990	120.4	30
Idaho	July	3, 1890	83,888	161,772	325,594	101.3	44
Wyoming	July	10, 1890	97,914	92,531	145,965	57.7	47
Utah	July	16, 1894	84,990	276,749	373,351	34.9	41
Oklahoma	Nov.	16, 1907	70,057	790,391	1,657,155	109.7	23
New Mexico	Jan.	6, 1912	122,634	195,310	327,301	67.6	43
Arizona	Feb.	14, 1912	113,956	122,931	204,354	66.2	45
Total[1]			[2]3,026,789	75,994,575	91,972,266	21.	

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[1] Including Alaska (64,356), Hawaii (191,909), Porto Rico (1,118,012), and military personnel abroad (55,608), the population in 1910 was 93,402,151. Adding estimates for the Philippine Islands (8,265,348), Guam, Tutuila and the Canal Zone, the total population of the United States and its possessions on April 15, 1910, was 101,748,269.

On July 1, 1918, the population of the continental United States, as estimated by the Bureau of the Census, was 105,253,300.

[2] 2,973,890 sq. miles land, 52,899 sq. miles water.

II. STATE TAXATION, INDEBTEDNESS, REVENUES AND EXPENDITURES

(In Thousands of Dollars)

The figures in this table are supplied by the Bureau of the Census from the report on "Financial Statistics of States" in preparation at the end of the year. They relate to the fiscal year ending June 30, 1917, or to the first fiscal period prior thereto.

State	Assessed Valuation of Property	Total Tax Levy	Bonded Debt	Net Debt[1]	Receipts		Expenditures	
					Revenue	Non-Revenue	Governmental Cost	Non-Governmental Cost
Alabama	665,737	4,466	9,057	13,266	7,277	4,406	7,779	4,146
Arizona	488,226	1,978	3,009	837	3,035	3,034	2,919	2,813
Arkansas	461,843	3,677	1,460	1,459	4,384	1,216	4,519	1,011
California	[2] 355,819	[3] 8,024	34,538	34,624	28,515	15,369	30,240	13,963
Colorado	1,211,697	3,443	3,762	3,738	5,363	7,287	4,712	7,093
Connecticut	1,946,485	5,938	13,000	12,497	12,437	3,888	8,736	4,324
Delaware	[4]	[5] 151	806	780	1,060	476	861	1,025
Florida	304,944	2,013	601	601	3,130	661	3,360	708
Georgia	954,141	5,351	6,041	6,127	7,318	3,195	6,588	3,480
Idaho	391,072	756	2,227	1,719	2,296	1,775	2,311	1,739
Illinois	2,502,086	21,247	242	2,056	22,830	5,896	23,082	9,670
Indiana	2,061,854	9,005	679	500	13,432	2,760	11,897	3,068
Iowa	1,262,639	4,819	....	....	10,561	3,413	10,747	3,503
Kansas	2,980,894	4,498	....	....	7,171	5,460	6,995	5,615
Kentucky	1,175,672	6,739	81	2,527	9,767	4,632	10,200	4,088
Louisiana	597,037	4,291	11,408	13,435	6,718	6,715	6,541	6,738
Maine	572,362	3,481	1,865	3,126	6,058	1,200	6,225	746
Maryland	1,336,727	4,260	26,285	19,269	8,761	9,830	10,563	7,605
Massachusetts	8,460,822	16,640	126,555	85,666	27,512	27,889	26,799	29,262
Michigan	3,071,521	13,323	....	6,921	22,655	6,762	23,636	6,672
Minnesota	1,705,043	6,929	1,695	1,695	20,190	6,485	17,598	6,965
Mississippi	429,200	2,684	3,052	5,426	4,448	3,336	5,031	2,308
Missouri	1,902,905	3,871	2,659	7,057	10,886	2,473	11,671	2,260
Montana	487,898	1,567	1,188	1,138	5,581	9,001	3,474	10,293
Nebraska	501,276	3,184	....	....	5,355	2,466	5,247	2,475
Nevada	174,471	867	300	680	1,360	1,187	1,186	1,102
New Hampshire	461,319	1,485	901	1,961	2,514	1,619	2,443	1,641
New Jersey	9,727,901	17,645	....	116	21,662	4,587	19,628	4,517
New Mexico	329,869	1,255	3,154	2,522	2,036	3,046	2,284	2,915
New York	11,790,628	26,256	236,309	188,322	65,661	59,477	77,284	37,604
North Carolina	889,565	2,803	8,753	8,883	5,398	2,883	4,916	3,261
North Dakota	354,496	1,459	497	493	4,606	4,406	4,437	4,812
Ohio	7,702,405	6,629	1	5,380	20,778	7,666	21,119	7,806
Oklahoma	1,248,811	2,604	6,381	6,350	8,776	7,917	6,665	9,361
Oregon	934,495	2,803	....	....	4,286	2,425	3,989	2,396
Pennsylvania	[4]	[5] 23,198	1,092	492	39,093	5,112	37,209	5,690
Rhode Island	905,687	2,310	7,449	6,405	3,860	492	3,981	664
South Carolina	496,050	2,121	5,345	5,477	3,266	8,080	3,353	7,923
South Dakota	1,303,500	1,522	....	....	3,971	2,678	3,015	2,699
Tennessee	680,961	2,766	12,886	15,813	5,252	1,708	5,703	1,419
Texas	2,749,725	13,904	4,695	4,695	23,982	4,864	19,992	4,533
Utah	531,935	2,708	2,860	2,650	3,944	3,576	3,896	3,104
Vermont	402,764	2,101	761	793	3,185	2,994	3,425	2,132
Virginia	1,211,682	3,852	22,523	23,231	8,840	5,101	8,824	5,536
Washington	987,339	7,799	268	1,040	11,296	4,203	10,965	4,437
West Virginia	1,298,520	2,376	....	....	4,621	5,892	3,996	6,097
Wisconsin	4,068,201	11,521	....	2,501	16,109	3,183	15,878	3,511
Wyoming	227,618	910	105	105	1,666	1,751	1,557	1,542

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[1] Net debt is funded and floating debt less sinking fund assets.

[2] Includes only the valuation of property subject to special property taxes; general property not assessed for State purposes.

[3] Includes $3,830, collections for special property taxes for which no assessed valuation is reported.

[4] General property not assessed for State purposes.

[5] Collections of special property taxes for which no assessed valuation is reported.

III. STATE CONSTITUTIONS

For the revision of the table of state constitutions on pp. 184–9 of the AMERICAN YEAR BOOK, for 1910, it is necessary only to note that the following states have adopted popular initiative as a second means of proposing amendments: California (1911), Colorado (1910), Massachusetts (1918), Michigan (1913), Nebraska (1912), North Dakota (1914), and Ohio (1912). The data for Arizona and New Mexico, admitted as states in 1912, are as follows:

STATE	Date	METHOD OF ADOPTION		PRESENT METHOD OF AMENDMENT			PRESENT METHOD OF GENERAL REVISION	
		Framed by	Popular Ratification	Proposed by	Limitations	Popular Ratification	Convention Called by	Popular Ratification
New Mexico.....	1911	Convention	Yes	⅔ members of each house	Not more than three at one time	Majority equal to 40 per cent. of total vote in one-half counties	¾ of each house and popular vote	Majority of votes
Arizona..........	1911	Convention	Yes	(1) Majority of each house (2) Popular initiative		Majority vote on question	Popular vote	Majority vote

IV. STATE AND TERRITORIAL GOVERNORS

STATE OR TERRITORY	Governor	Capital	Length of Term	Term Expires	Salary
Maine..........................	*C. E. Milliken*	Augusta	2	January, 1921	$5,000
New Hampshire..................	*J. H. Bartlett*	Concord	2	January, 1921	3,000
Vermont........................	*P. W. Clement*	Montpelier	2	January, 1921	3,000
Massachusetts..................	*C. Coolidge*	Boston	1	January, 1920	10,000
Rhode Island...................	*R. L. Beeckman*	Providence	2	January, 1921	3,000
Connecticut....................	*M. H. Holcomb*	Hartford	2	January, 1921	5,000
New York.......................	A. E. Smith	Albany	2	January, 1921	10,000
New Jersey.....................	*W. E. Edge*	Trenton	3	January, 1920	10,000
Pennsylvania...................	*W. C. Sproul*	Harrisburg	4	January, 1923	10,000
Delaware.......................	*J. G. Townsend*	Dover	4	January, 1921	4,000
Maryland.......................	E. C. Harrington	Annapolis	4	January, 1920	4,500
Virginia.......................	Westmoreland Davis	Richmond	4	February, 1922	5,000
West Virginia..................	J. J. Cornwell	Charleston	4	March, 1921	5,000
North Carolina.................	T. W. Bickett	Raleigh	4	January, 1921	6,500
South Carolina.................	R. A. Cooper	Columbia	2	January, 1921	3,000

Democrats in Roman; Republicans in *Italics.*

IV. STATE AND TERRITORIAL GOVERNORS—*Continued*

State or Territory	Governor	Capital	Length of Term	Term Expires	Salary
Georgia	Hugh M. Dorsey	Atlanta	2	June, 1921	$5,000
Florida	Sidney J. Catts	Tallahassee	4	January, 1921	6,000
Kentucky	J. D. Black	Frankfort	4	December, 1919	6,500
Tennessee	A. H. Roberts	Nashville	2	January, 1921	4,000
Alabama	T. E. Kirby	Montgomery	4	January, 1923	7,500
Mississippi	T. G. Bilbo	Jackson	4	January, 1920	4,500
Arkansas	C. H. Brough	Little Rock	2	January, 1921	4,000
Louisiana	R. G. Pleasant	Baton Rouge	4	April, 1920	7,500
Texas	W. P. Hobby	Austin	2	January, 1921	4,000
Oklahoma	J. B. A. Robertson	Oklahoma City	4	January, 1923	4,500
Ohio	J. M. Cox	Columbus	2	January, 1921	10,000
Indiana	*J. P. Goodrich*	Indianapolis	4	January, 1921	8,000
Illinois	*F. O. Lowden*	Springfield	4	January, 1921	12,000
Michigan	*A. E. Sleeper*	Lansing	2	January, 1921	5,000
Wisconsin	*E. L. Philipp*	Madison	2	January, 1921	5,000
Minnesota	*J. A. A. Burnquist*	St. Paul	2	January, 1921	7,000
Iowa	*W. L. Harding*	Des Moines	2	January, 1921	5,000
Missouri	F. D. Gardner	Jefferson City	4	January, 1921	5,000
Kansas	*H. J. Allen*	Topeka	2	January, 1921	5,000
Nebraska	*S. R. McKelvie*	Lincoln	2	January, 1921	2,500
South Dakota	*P. Norbeck*	Pierre	2	January, 1921	3,000
North Dakota	S. J. Doyle	Bismarck	2	January, 1921	5,000
Montana	S. V. Stewart	Helena	4	January, 1921	7,500
Idaho	*D. W. Davis*	Boise	2	January, 1921	5,000
Wyoming	*R. D. Carey*	Cheyenne	4	January, 1923	4,000
Colorado	T. J. Tynan	Denver	2	January, 1921	5,000
New Mexico	*O. O. Larrazolo*	Santa Fé	4	January, 1920	5,000
Arizona	*Thomas Campbell*	Phoenix	2	January, 1921	6,000
Utah	S. Bamberger	Salt Lake City	4	January, 1921	4,000
Nevada	Emmet Boyle	Carson City	4	January, 1923	4,000
California	*W. D. Stephens*	Sacramento	4	January, 1923	10,000
Oregon	*James Withycombe*	Salem	4	January, 1923	5,000
Washington	Ernest Lister	Olympia	4	January, 1921	6,000
Alaska	J. F. A. Strong	Juneau	4	April, 1921	7,000
Hawaii	L. E. Pinkham	Honolulu	4	November, 1921	7,000
Porto Rico	Arthur Yager	San Juan	Indef.		10,000
Philippine Islands	F. B. Harrison	Manila	Indef.	–	18,000

Democrats in Roman; Republicans in *Italics*.

V. STATE AND TERRITORIAL LEGISLATURES

State or Territory	Number of Members		Length of Term (years)		Regular Sessions	Regular Session Begins	Limit of Session (days)	Salary
	Senate	House	Senate	House				
Maine	31	151	2	2	Biennial	January, 1919	None	$400 per year.
New Hampshire	24	404	2	2	Biennial	January, 1919	None	200 per term.
Vermont	30	247	2	2	Biennial	January, 1919	None	4 per day.
Massachusetts	40	240	1	1	Annual	January, 1919	None	1,000 per year.
Rhode Island	39	100	2	2	Annual	January, 1919	60	5 per day.
Connecticut	35	258	2	2	Biennial	January, 1919	5 mo.	300 per year.
New York	51	150	2	1	Annual	January, 1919	None	$1,500 per year.
New Jersey	21	60	3	1	Annual	January, 1919	None	500 per year.
Pennsylvania	50	207	4	2	Biennial	January, 1919	None	1,500 per year.
Delaware[1]	17	35	4	2	Biennial	January, 1919	60	5 per day.
Maryland	27	102	4	2	Biennial	January, 1920	90	$5 per day.
Virginia	40	100	4	2	Biennial	January, 1920	60[2]	8 per day.
West Virginia[1]	30	86	4	2	Biennial	January, 1919	45	4 per day.
North Carolina	50	120	2	2	Biennial	January, 1919	60	4 per day.
South Carolina	44	124	4	2	Annual	January, 1919	40	200 per session.
Georgia	44	189	2	2	Annual	June, 1919	50	4 per day.
Florida	32	71	4	2	Biennial	April, 1919	60	6 per day.
Kentucky	38	100	4	2	Biennial	January, 1920	60	$10 per day.
Tennessee	33	99	2	2	Biennial	January, 1919	75	[illegible] per day.
Alabama	35	106	4	4	Quadrennial	January, 1919	50	4 per day.
Mississippi	45	136	4	4	Biennial	January, 1920	45	500 per session.
Arkansas	35	100	2	2	Biennial	January, 1919	60	6 per day.
Louisiana	41	118	4	4	Biennial	April, 1920	60	5 per day.
Texas	31	143	4	2	Biennial	January, 1919	None	5 per day.[3]
Oklahoma	44	111	4	2	Biennial	January, 1919	60	6 per day.[3]

Democratic legislatures in Roman; Republican in *Italic*. [1] Republican Senate; Democratic House. [2] Can be extended 30 days by $\frac{3}{5}$ vote.
[3] For 60 days; $2 per day thereafter.

V. STATE AND TERRITORIAL LEGISLATURES—*Continued*

State or Territory	Number of Members		Length of Term (years)		Regular Sessions	Regular Session Begins	Limit of Session (days)	Salary
	Senate	House	Senate	House				
Ohio	33	123	2	2	Biennial	January, 1919	None	$1,000 per year.
Indiana	50	100	4	2	Biennial	January, 1919	61	6 per day.
Illinois	51	153	4	2	Biennial	January, 1919	None	3,500 per session.
Michigan	32	100	2	2	Biennial	January, 1919	None	800 regular session. 5 per day, extra session.
Wisconsin	33	100	4	2	Biennial	January, 1919	None	500 per session.
MINNESOTA	67	130	4	2	Biennial	January, 1919	90	1,000 per session.
Iowa	50	108	4	2	Biennial	January, 1919	None	1,000 regular session. 10 per day, extra session.
Missouri	34	142	4	2	Biennial	January, 1919	70	5 per day.
Kansas	40	125	4	2	Biennial	January, 1919	None	3 per day.
Nebraska	33	100	2	2	Biennial	January, 1919	60	600 per session.
South Dakota	45	104	2	2	Biennial	January, 1919	60	5 per day.
NORTH DAKOTA	49	113	4	2	Biennial	January, 1919	60	5 per day.
Montana	41	95	4	2	Biennial	January, 1919	60	$10 per day.
Idaho	33	61	2	2	Biennial	January, 1919	60	5 per day.
Wyoming	27	57	4	2	Biennial	January, 1919	40	8 per day.
Colorado	35	65	4	2	Biennial	January, 1919	90	1,000 per session.
New Mexico	24	49	4	2	Biennial	January, 1919	60	5 per day.
Arizona	19	35	2	2	Biennial	January, 1919	60	7 per day.
Utah	18	45	4	2	Biennial	January, 1919	60	4 per day.
Nevada[1]	22	53	4	2	Biennial	January, 1919	60	10 per day.
California	40	80	4	2	Biennial	January, 1919	[2]	1,000 regular session. 10 per day, extra session.
Oregon	30	60	4	2	Biennial	January, 1919	40	3 per day.
Washington	42	97	4	2	Biennial	January, 1919	60	5 per day.
Alaska	8	16	4	2	Biennial	March, 1919	60	$15 per day.
Hawaii	15	30	4	2	Biennial	February, 1919	60	600 per session.
Porto Rico	19	39	4	4	Annual	February, 1919	60	7 per day, members of House. 3,000 per year for 4 members of Senate, 5 serving without pay.
Philippine Islands	24	90	6	3	Annual	October, 1919	100	4,000 for senators 3,000 for representatives

Democratic legislatures in Roman; Republican in *Italic*. Non-Partisan in SMALL CAPS. [1]Republican Senate, Democratic House. [2]Split session; first part 30 days; recess 30 days; no limit to second part.

VI. STATE UDICIARY

State	Highest State Court					Other Courts				
	Name of Court	No.of Judges	Length of Term (years)	How Chosen	Salary	Name	No. of Dists.	No. of Judges	Term (years)	How Chosen
Maine	Supreme Court	7	7	Gov.and Council	$5,000	Nisi Prius	......	......	......	......
New Hampshire	Supreme Court	5	[1]	Gov. and Council	5,000	Superior Courts in 2 counties	...	2	7	Gov. and Council
						Superior Court	10	5	(a)	Gov. and Council
Vermont	Supreme Court	5	2	Legislature	4,000	County Courts	14	6	2	Legislature
Massachusetts	Supreme Court	7	[2]	Gov. and Council	10,500	Superior Court	......	28	(b)	Gov. and Council
					10,000					
Rhode Island	Supreme Court	5	[3]	Legislature	8,000	Superior Court	......	7	(c)	Legislature
Connecticut	Court of Errors	5	8	Gov. and Legislature	7,000	District Courts	12	13	3	Legislature
					8,000	Superior Court	8	11	8	Gov. and Legis.
					7,500	Court of Common Pleas in 5 counties	5	8	4	Gov. and Legis.
New York	Court of Appeals	7	14	Elected	$14,200	Appellate Division	4	25	......	......
					13,700	Supreme Court	9	107	14	Elected
						County Courts	......	......	6	Elected
New Jersey	Court of Errors and Appeals	16	7	Gov. and Senate	13,000	Chancery	......	9	7	Gov. and Senate
					12,000					
						Supreme Court	9	9	7	Gov. and Senate
						Circuit Court	6	6	7	Gov. and Senate
						County Courts	......	......	......	Gov. and Senate
Pennsylvania	Supreme Court	7	21	Elected	13,500	Superior Court	5	7	10	Elected
					13,000	Court of Common Pleas	......	......	......	......
Delaware	Court of Errors and Appeals	6	12	Gov. and Senate	5,000	Chancellor	......	......	12	Gov. and Senate
Maryland	Court of Appeals	8	15	Elected by Districts	$6,800	Circuit Courts	8	22	15	Elected
						Special Courts, in Balt.	......	......	......	......
Virginia	Supreme Court of Appeals	5	12	Legislature	5,200	Circuit Courts	31	31	8	Legislature
					5,000					
West Virginia	Supreme Court of Appeals	5	12	Elected	5,500	Circuit Courts	23	24	8	Elected
North Carolina	Supreme Court	5	8	Elected	4,000	Superior Court	20	20	8	Elected
South Carolina	Supreme Court	5	8	Legislature	3,000	Circuit Courts	14	14	8	Legislature
Georgia	Supreme Court	6	6	Elected	4,000	Court of Appeals	3	6	6	Elected
						Superior Court	28	31	4	Elected
Florida	Supreme Court	5	6	Elected	4,500	Circuit Courts	13	14	4	Gov. and Senate
						County Courts	......	......	......	......

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[1] Until 70 years of age. [2] During good behavior. [3] Until removed by the legislature.

VI. STATE JUDICIARY—*Continued*

STATE	HIGHEST STATE COURT					OTHER COURTS				
	Name of Court	No. of Judges	Length of Term (years)	How Chosen	Salary	Name	No. of Dists.	No. of Judges	Term (years)	How Chosen
Kentucky	Court of Appeals	7	8	Elected by districts	$5,000	Circuit Courts	35	43	6	Elected
Tennessee	Supreme Court	5	8	Elected	5,000	Court of Civil Appeals	23	5	8	Elected
						Chancery Court	14	14	8	Elected
						Circuit Courts	18	18	8	Elected
						Criminal Court	8	8	8	Elected
Alabama	Supreme Court	7	6	Elected	5,000	Chancery Courts	5	5	6	Elected
						Circuit Courts	16	16	6	Elected
Mississippi	Supreme Court	3	9	Gov. and Senate	4,500	Chancery Courts	......	......	4	Gov. and Senate
						Circuit Courts	13	......	4	Gov. and Senate
Arkansas	Supreme Court	5	8	Elected	4,000	Circuit Courts	18	21	6	Elected
Louisiana	Supreme Court	5	12	Elected	6,000	Circuit Courts of Appeals	4	9	8	Elected
						District Courts	30	32	4	Elected
Texas	Supreme Court	3	6	Elected	5,000	Court of Criminal Appeal	......	3	6	Elected
						Courts of Civil Appeals	9	27	6	Elected
						District Courts	......	......	4	Elected
Oklahoma	Supreme Court	9	6	Elected	4,000	Criminal Court of Appeals	3	3	6	Elected
						District Courts	27	33	4	Elected
Ohio	Supreme Court	7	6	Elected	$6,500	Courts of Appeal	8	24	6	Elected
						Courts of Common Pleas	......	......	6	Elected
Indiana	Supreme Court	5	6	Elected	6,000	Appellate Courts	2	6	4	Elected
						Circuit Courts	68	68	6	Elected
						Superior Courts in 10 cos.	......	14	4	Elected
Illinois	Supreme Court	7	9	Elected	10,000	Courts of Appeal	4	15	......	....
						Circuit Courts	18	65	6	Elected
						County Courts	102	102	4	Elected
Michigan	Supreme Court	8	8	Elected	7,000	Circuit Courts	39	49	6	Elected
Wisconsin	Supreme Court	7	10	Elected	7,500	Circuit Courts	20	25	6	Elected
Minnesota	Supreme Court	5	6	Elected	7,000	District Courts	19	46	6	Elected
Iowa	Supreme Court	7	6	Elected	6,000	District Courts	21	64	4	Elected
Missouri	Supreme Court	7	10	Elected	7,500	Courts of Appeal	3	9	12	Elected
						Circuit Courts	38	65	6	Elected
Kansas	Supreme Court	7	6	Elected	4,000	District Courts	34	38	4	Elected
Nebraska	Supreme Court	7	6	Elected	4,500	District Courts	18	32	4	Elected
South Dakota	Supreme Court	5	6	Elected	3,600	Circuit Courts	12	13	4	Elected
North Dakota	Supreme Court	5	6	Elected	5,500	District Courts	12	12	4	Elected

VI. STATE JUDICIARY—*Continued*

State	Highest State Court					Other Courts				
	Name of Court	No. of Judges	Length of Term (years)	How Chosen	Salary	Name	No. of Dists	No. of Judges	Term (years)	How Chosen
Montana	Supreme Court	3	6	Elected	$6,000	District Courts	18	27	4	Elected
Idaho	Supreme Court	3	6	Elected	5,000	District Courts	9	12	4	Elected
Wyoming	Supreme Court	3	8	Elected	5,000	District Courts	7	7	6	Elected
Colorado	Supreme Court	7	10	Elected	5,000	District Courts	13	22	6	Elected
						County Courts	.....	.....	.....	.....
New Mexico	Supreme Court	3	8	Elected	6,000	District Courts	8	8	6	Elected
Arizona	Supreme Court	3	6	Elected	5,000	Superior Courts	14	14	4	Elected
Utah	Supreme Court	3	6	Elected	5,000	District Courts	7	12	4	Elected
Nevada	Supreme Court	3	6	Elected	6,000	District Courts	10	10	4	Elected
California	Supreme Court	7	12	Elected	8,000	Courts of Appeal	3	9	12	Elected
						Superior Courts	58	103	4	Elected
Oregon	Supreme Court	7	6	Elected	4,500	Circuit Courts	20	25	6	Elected
Washington	Supreme Court	9	6	Elected	6,000	Superior Courts	39	59	4	Elected

VII. COUNTY OFFICERS

State	No. of Counties	County Bd., No. of Members	County Judge	Probate Judge	Prosecuting Attorney	Sheriff	Coroner	Clerk of Court	Register of Probate	County Clerk	Register of Deeds	County Auditor	County Assessor	County Treasurer	County Surveyor	Supt. of Schools	Supt. of Poor	Health Officer
Maine	16	3		El.	El.	El.	App.	El.	El.	.....				El.				
New Hampshire	10	3		App.	El.	El.	App.	App.	El.	.....	El.	App.	El.	El.		El.	App.	App.
Vermont	14		El.	dist.	El.	El.		App.	App.	App.	El.	App.		App.				
Massachusetts	14	3		App.	Dist.	El.	.....	El.	El.	.....	El.			El.				
Rhode Island	5	None				App.		App.										
Connecticut	8	App. 3	s.	dist.	App.	El.	App.	App.				App.		App.				App.
New York	62	Var.	El.	El.	El.	El.	El.	.....		El.	s.	s.		El.		dist.	App.	App.
New Jersey	21	Var.	App.	App.	App.	El.	El.	.....		El.	s.	App.		App.	App.	App.	s.	
Pennsylvania	67	3	El.	El.	El.	El.	El.	El.	El.	App.	El.	El.	El.	El.	El.	El.	s.	App.
Delaware	3	7–10		El.		El.	El.	El.	El.	.....	El.			El.	App.	App.	App.	App.
Maryland	24	3–7		El.	El.	El.	App.	El.		App.	El.	App.	App.	El.	El.	App.	App.	App.
Virginia	100 18*a*	3–8		.....	El.	El.	App.	El.		El.	.....			El.	App.	App.	App.	App.
West Virginia	55	3			El.	El.	App.	El.		El.			El.		El.	El.	App.	App.

VII. COUNTY OFFICERS—*Continued*

STATE	No of Counties	County Bd., No. of Members	County Judge	Probate Judge	Prosecuting Attorney	Sheriff	Coroner	Clerk of Court	Register of Probate	County Clerk	Register of Deeds	County Auditor	County Assessor	County Treasurer	County Surveyor	Supt. of Schools	Supt. of Poor	Health Officer
North Carolina	100	3–5			Dist.	El.	El.	El.		.....	El.			El.	El.	App.	App.	App.
South Carolina	44	Var.		El.	Dist.	El.	El.	El.		.....	s.	App.		El.		El.		App.
Georgia	152	3–5	sEl.	El.	Dist.	El.	El.	El.		El.	El.		App.	El.	El.	El.	s.	App.
Florida	52	5	El.	.....	Dist.	El.		El.					El.	El.	El.	El.		App.
Kentucky	120	3–8	El.	.....	El.	El.	El.	El.		El.			El.	App.	El.	El.		App.
Tennessee	96	3	El.	.....	Dist.	El.	App.	El.		.....	El.	.....	s.	El.	App.	App.		App.
Alabama	67	5	.....	El.	Dist.	El.	El.	El.			.....		El.	El.	App.	El.		App.
Mississippi	79	5			El.	El.	El.	El.				El.	El.	El.	El.	El.		App.
Louisiana	64*b*	Var.			El.	El.	El.	El.		El.	.....		El.	App.	App.	App.		App.
Texas	253	3	El	.....	El.	El.		El.		El.	.....	El.	El.	El.	El.	El.	App.	App.
Oklahoma	78	3		El.	El.	El.	El.			El.	El.		El.	El.	El.	El.	.....	App.
Arkansas	75	Var.	El.	.....	Dist.	El.	El.	El.		.....	.....		El.	El.	El.	App.		App.
Missouri	114	3		El.	El.	El.	El.	El.		El.	s.	s.	El.	El.	El.	El.		App.
Ohio	88	3	El.	El.	El.	El.	El.	El.		El.		El.	App.	El.	El.	App.		
Indiana	92	3(7)*c*	s.	s.	El.	El.	El.	El.			El.	El.	El.	El.	El.	App.	App.	App.
Illinois	102	Var.	El.	s.	El.	El.	El.	El.		El.	El.	.....	s.	El.	El.	El.	App.	
Michigan	83	Var.		El.	El.	El.	El.	.....		El.	El.	s.		El.	El.	El.	App.	
Wisconsin	71	Var.	El.	El.	El.	El.	El.	El.		El.	El.	.....	El.	El.	El.	El.	App.	App.
Minnesota	86	5–7		El.	El.	El.	El.	El.		.....	El.	El.		El.	El.	El.		.....
Iowa	99	3–7			El.	El.	El.	El.		.....		El.		El.	El.	App.	App.	App.
Kansas	105	3	El.	El.	El.	El.	El.	El.		El.	El.	App.		El.	El.	El.	App.	App.
Nebraska	93	Var.	El.	.....	El.	El.	El.	El.		El.	s.			El.	El.	El.		
South Dakota	63	1–5	El.	.....	El.	El.	El.	El.		.....	El.	El.	s.	El.	El.	El.		App.
North Dakota	53	3–5	El.	El.	El.	El.	El.	El.		.....	El.	El.	s.	El.	El.	El.		App.
Montana	43	3			El.	El.	El.	El.		El.	El.	El.	El.	El.	El.	El.		App.
Idaho	37	3		El.	El.	El.	El.	El.		.....	.....	.....	El.	El.	El.	El.		
Wyoming	21	3		.....	El.	El.	El.	s.		El.	.....		El.	El.	El.	El.		App.
Colorado	63	3–5	El.	.....	Dist.	El.	El.	.....		El.	.....		El.	El.	El.	El.	.....	.....
New Mexico	26	3		El.	Dist.	El.	.....	El.	El.		.....		El.	El.	El.	El.		.....
Arizona	14	3		El.	El.	El.	El.	El.		s.	El.		El.	El.	El.	El.		App.
Utah	27	3			El.	El.		.....		El.	El.	s.	El.	El.	El.	El.		
Nevada	16	3		.....	El.	El.	.....	.....		El.	El.	El.	El.	El.	El.	El.		
California*	58	3–5	El.	.....	El.	El.	El.	App.		El.	s.	El.	El.	El.	El.	El.		App.
Oregon	36	3		.....	Dist.	El.	El.	.....		El.	s.	El.	El.	El.	El.	El.		
Washington	39	3		.....	El.	El.	El.	.....		El.	.....	El.	El.	El.	El.	El.		App.

a. Cities. *b*. Parishes. *c*. 3 county commissioners; 7 members in the county councils. El., an elective county office. s., a county office in some counties. App., an appointive county office. ....., duties performed by some other officer. dist., elected or appointed for district smaller than a county. Var., number varies in different counties. Dist., elected or appointed for district larger than a county. *In Los Angeles county, the most populous county in California, the "short ballot" has been adopted. The only county officers elected by popular vote are the board of supervisors, auditor, district attorney, and assessor. All others are appointed by the board of supervisors.

STATE ADMINISTRATION

John M. Mathews

State Councils of Defense.—The year 1918 was in some respects an off year in state governmental development, as comparatively few state legislatures were in session and the attention of the entire nation was centered on the various national activities connected with the winning of the war. In spite of the abnormal conditions, however, and to some extent on account of them, there were important developments in state administration during the year. The war, which left no phase of American life untouched, has not failed to affect the administrative activities of the states deeply and in many ways. The state governments have been important agencies in assisting the National Government in its war activities, and State Councils of Defense in many states have coöperated vigorously with the National Government in the prosecution of the war. In 23 states these Councils of Defense have been established under the authority of formal legislative enactments. The powers granted to and exercised by them have been of a broad and general character, but such powers are to be exercised in subordination to the superior control of national administrative authorities. The specific activities of State Councils of Defense have been carried on both on their own initiative and at the instance of the Council of National Defense and of various departments of the National Government. Among the different phases of their work have been those dealing with the preservation of order, labor supply, fire prevention, food conservation, and Americanization. In some states in which neither regular nor special legislative sessions have been held, they have to some extent filled the breach, as in Minnesota, where, at the instance of the State Council or Commission of Safety, uniform ordinances were passed by a large number of municipalities.

State Police.—The unsettled and abnormal conditions in the states due to the war have convinced the people in many states that we cannot afford to continue the attempt to muddle through with the feeble and ineffectual agencies that might have been tolerably satisfactory in times of peace. The war has stimulated both the invigoration by the states of existing agencies of administration and also the creation of new agencies and the assumption of new functions. The necessity of making provision for safeguarding munition plants, shipping facilities and other instrumentalities for the prosecution of the war from destruction or injury by German sympathizers has developed to some extent upon the states. In many states the Councils of Defense have been active in supervising the organization of home guards to take the place of the state militia which had been mustered into the national service, and have directed their activities in maintaining order and security in the various localities. State police forces have already been organized in a number of states. During 1918 a bill providing for such a force in New Jersey failed by a narrow margin to become a law. In Oregon, the State Emergency Board, through its power of authorizing extraordinary expenditures, provided for the organization of the state military police of 200 trained men. The creation of this body provides an instrument whereby the governor may be enabled to carry out his constitutional duty of seeing that the laws are faithfully executed, for the performance of which he has had heretofore inadequate facilities. The tendency is to confer upon these state police forces not only the ordinary police functions of maintaining order, apprehending criminals and bringing back fugitives from justice, but also such miscellaneous duties as acting as special police, detectives and ticket-takers at the state fairs, and promoting the general social welfare through acting as sanitary agents of the state health department, performing the duties now vested in state fish, game and fire wardens and, in general, any functions of such a character as not to require more special skill or technical knowledge than general police agents could be expected to possess. The taking over of such functions by the state police, or the incorporation of a miscellaneous group of existing state agents, such as game wardens, into such a compact and well directed organization as the state police, provides a more efficient method of performing the functions entrusted to them.

State Public Service Commissions.—The enormous expansion of national administrative activities incident to the prosecution of the war has tended in some directions to interfere with or displace the work of state agencies in these respects. Probably the most conspicuous example of this tendency was the taking over of the management by the National Government of railroads, telegraph and telephone lines (see XIX, *Trade, Transportation, and Communication*). The regulation of these great public utilities was, before the war, one of the most important branches of the activities of state public service commissions. The continuation of the regulation of these utilities by state agencies, however, was deemed by the National Administration as being inconsistent with national control and was consequently abandoned for the time being. State public service commissions were reduced in many states to the regulation of local public utilities, and in some states these commissions were hard pressed to find sufficient work to do to justify the continued existence of their offices.

Public Works.—The war and the exigencies of the national situation have also interfered with certain state administrative activities and the carrying out of projects involving the outlay of considerable sums of money. This has been brought about in part through the control exercised by the National Capital Issues Committee in declining to authorize the issuance of bonds for these purposes, and more especially through stringency of the money market incident to the flotation of the successive Liberty Loans. The high price of materials and the scarcity of labor, both due incidentally to war conditions, have also interfered with carrying out such projects, and made it manifestly unwise to attempt to carry them through on any large scale until such conditions are removed. With the advent of peace and the demobilization of the army will come the propitious time for the renewal of activities in this direction, such as the construction of public buildings, roads and works. In this connection it may be mentioned that at the November election the voters of Illinois by a large majority authorized the issuance by that state of $60,000,000 in bonds to defray the expense of constructing a comprehensive network of hard-surfaced roads throughout the state. No increase in the tax rate thereby is contemplated, but the interest on the bonds is to be paid from the proceeds of automobile license fees and the work is to begin as soon as conditions become more nearly normal. It may also be remarked incidentally that at the same election the voters of Illinois approved by a safe majority the proposition for holding a state constitutional convention, the delegates to which will be elected in accordance with the provisions of a law to be enacted by the next session of the legislature. This will pave the way for the introduction of many needed reforms in the state, such as the short ballot and other improvements in state administration.

Social Hygiene.— Another respect in which the activities of the National Government during the war has affected those of the states and localities has been in connection with the control of conditions at or near military posts and army camps scattered over the country. The states and localities have been notoriously inefficient, as a general rule, in the enforcement of prohibitory liquor and anti-vice laws. Their failure to enforce such laws at or near military camps has led to drastic action by the War Department either in enforcing such laws through its own agents or in galvanizing the state and local authorities into action by the threat to remove the camps to other localities. Many state departments of health and, in some states, semiprivate organizations supported by state funds have been active in attempting to control venereal diseases, but their activities in most states have been cramped on account of the lack of adequate funds. The matter of the financial support of social-hygiene work in the states, however, has now been somewhat simplified by the Army Appropriation Act of July 9, 1918. Chapter XV, Section 6, of this Act makes an appropriation annually for the two years beginning July 1, 1918, of $1,000,000 to be paid to the states for the use of their respective boards or departments of health in the control of social diseases; this sum to be allotted to each state in the proportion which its population bears to that of the whole country according to the last census, and such allotment to be so conditioned that for each dollar paid to any state, that state shall appropriate an equal amount for the control of such diseases, except for the fiscal year ending June 30, 1919, for which the allotment of Federal money is not conditioned upon such appropriation. The sum of $400,000 annually for these two years is also appropriated for use in the control of such diseases by such institutions or organizations as may be approved by the Interdepartmental Social Hygiene Board. (See also XIV, *Social Hygiene.*)

Consolidation of State Boards.—In spite of, and, to some extent, on account of war conditions, the movement for the reorganization of state administration in the interests of efficiency and economy continues to gather headway. Although the war has focused the attention of the people throughout the country upon international relations, it is nevertheless possible to discern certain by-products of the great conflict in the increased interest of the people in efficient government, both in nation and in state, and in their growing impatience with the results obtained from the cumbrous and antiquated forms of government with which we have hitherto been afflicted. Mention was made in the YEAR BOOK for 1917 (p. 177) of the acts passed in that year in Kansas and Illinois providing for the consolidation of various state agencies. During 1918 some experience with the working of these acts has been obtained. The Kansas act contained two unfortunate features. In the first place, the State Board of Administration created was to constitute a board of trustees for the control of three different kinds of institutions, namely, all educational, charitable and penal institutions of the state. The methods and needs of these three kinds of institutions are probably too heterogeneous to be brought satisfactorily under the immediate control of a single agency. In the second place the legislature parsimoniously limited the salaries of the members of the Board and of the business manager appointed by them to $3,500 per year, which is too small to attract the right sort of men for work of this kind. In spite of these handicaps, however, a capable business manager was secured, who brought the institutions through the fiscal year without a deficit, without having to close any of the institutions or to curtail their work, in spite of the greatly increased prices for material and labor. The Illinois Consolidation Act or Civil Administrative Code of 1917 has now been in effect more than a year. Some minor defects have shown themselves, but, on the whole, it is working with considerable smoothness. Any minor difficulties which appear may easily be remedied within the limits of the constitution. The most conspicuous need is to make the Act more comprehensive by including within the scheme certain agencies which are now left outside. Some of these can be brought in by mere legislative action, but the more important ones can be brought in only by constitutional change. The carrying out of such change will undoubtedly be one of the propositions to be brought before the coming Illinois Constitutional Convention, the calling of which, as already indicated, the voters of the state have authorized. (See also *Popular Government, infra.*)

Efficiency and Economy Commissions.—In most states which have considered the question of reorganization in the interest of economy and efficiency, the development is still largely in the investigational stage. An account of the work of state efficiency and economy commissions has recently been published in a bulletin of the New York Bureau of Municipal Research (No. 90, October, 1917), entitled "The State Movement for Efficiency and Economy," by Raymond Moley. This gives an account of the work of 14 state commissions, in addition to that of the State Board of Public Affairs of Wisconsin and the former Department of Efficiency and Economy of New York. Since the publication of this monograph, several reports by state investigational bodies have been issued, among the more important of which are those of the Virginia Commission on Economy and Efficiency and the Oregon Consolidation Commission. The Virginia Commission consisted of three members of the legislature and two citizens, appointed under an act of 1916, and "charged with the duty of making a careful and detailed study of the organization and methods of the state and local governments and with reporting to the next general assembly in what way the state and local government can be more efficiently and economically administered." The report of the Commission, issued early in 1918, deals in the main only with the executive department of the state government, and points out the familiar defects of state administration which are illustrated in the experience of Virginia, such as the diffusion of authority and responsibility, the lack of official accountability for the administration of the state's affairs, the excessive number of petty elective officers, and the useless multiplication of boards, bureaus and other agencies without any attempt to coördinate functions, make readjustments, or establish proper executive control. The Commission recommends that the power of appointment, control and removal of all administrative officers should be vested, as far as possible, in the governor. "The governor should be the business manager of the state in fact as well as in name. He should be held responsible for the proper management of all departments and agencies, and should be given the power to have his policies carried out and his orders promptly executed." A number of other miscellaneous suggestions are made relating to the supervision of accounts, including expense accounts, uniform fiscal year, abolition of fees, uniform office hours, leaves of absence, collective purchase of supplies, state insurance, civil-service regulations, and the public school system.

The Oregon Consolidation Commission was composed of seven business men appointed by the governor. The concurrent resolution under which it was created contemplated a "thorough investigation of the several offices, boards, commissions and departments of the state as to the scope, nature and importance of the different branches of the work performed by each, and that the above mentioned commission be required to make a complete and comprehensive report of its findings, together with such recommendations as to consolidation, economy and efficiency, as they may find feasible, to the next regular session of the legislative assembly." The Commission employed an expert to make the actual investigation of the administrative departments and to formulate its report. The Commission found that no efficient and businesslike administration of state affairs in Oregon could be expected unless some one officer, who should be fully responsible to the people, could control all the important departments of the administration. It was held that the governor was the logical officer to fill this position, but he did not do so under existing conditions because, in the first place, the administration was split up into too many departments for the governor to exercise adequate control over them, and, in the second place, there were too many elective officers, with the result that there were in reality many governors in the state instead of one. In order to remedy the first of these difficulties, the Commission recommended that the separate administrative agencies, of which there were about 70 which had been created by the legislature from time to time without system or coördination, should be consolidated into 11 main departments, which should include all such agencies with the exception of the proposed State Civil Service Commission and the state police. In order to remedy the second of these difficulties, the Commission recommended that, in so far as feasible within the limits of the constitution, the short ballot should be introduced through the elimination of unnecessary elective officers.

One of the most pressing problems in Oregon for some time has been that of the proper organization of state control over its institutions of higher education. The State University, the State Agricultural College and the State Normal School are located at different places in the state, the situation in this respect being similar to that in Iowa. The question has been whether to continue the separate boards or to consolidate the institutions under the control of a single board. The report of the Commission, as formulated by its expert, recommended that what was called the "three-in-one plan" should be introduced as a compromise, whereby there should be a State Board of Education of nine members, to be composed of three institutional committees of three members each, one committee for each of the three institutions. These committees were to appoint the presidents and faculties of their respective institutions and to attend to local and special matters, while the three committees together, composing the whole State Board of Education, were to attend to matters affecting more than one of the institutions, such as formulating requests for any appropriations needed above the proceeds of the millage tax and taking over the functions of the Board of Higher Curricula in eliminating, so far as possible, duplication of work among the several higher educational institutions.

State Budgets.—Both the Virginia and the Oregon Commissions recommended the introduction of the executive budget system. The increased expense of carrying on the regular operations of state government under war conditions, together with the additional functions undertaken in connection with the coöperation of the states in the war, have so greatly increased the financial burden of the states as to make more necessary than ever the careful and systematic planning of the budget under responsible leadership. The proposed budget law drafted by the Virginia Commission was enacted by the legislature of that state in 1918 by an almost unanimous vote and went into effect in June. It follows to some extent the main features of the Maryland executive budget law (*A. Y. B.*, 1916, p. 353), which during the year had its initial trial and proved fairly successful, though inadequate consideration was given by the legislature to the governor's estimates. Experience in the operation of budget laws is indicating possible lines of improvement in procedure and content. It is now recognized that the questions of budget making and of the organization of the administration are intimately related. The scattered and disorganized condition of the administrative agencies has interfered with the development of a scientific budget system. The considerable number of separate agencies and the consequently large number of separate requests for appropriations makes it difficult for the budget-making authority to give them any adequate examination. If the power of formulating the budget is conferred upon the governor, then, in order to make this power effective and influential the governor must be made the real, instead of the mere nominal, head of the administration. (See also XIII, *Public Finance.*)

References.—*American Political Science Review*, August, 1918, p. 509; *Proceedings of the Academy of Political Science, July*, 1918, *passim;* R. Moley, "The State Movement for Efficiency and Economy" (New York Bureau of Municipal Research, Bulletin No. 90, October, 1917); *National Municipal Review*, July, 1918, pp. 375, 384; *ibid.*, September, 1918, p. 472.

POPULAR GOVERNMENT AND CURRENT POLITICS

ARTHUR N. HOLCOMBE

The Massachusetts Constitutional Convention.—The second session of the Massachusetts Constitutional Convention (June to August, 1918) completed the work left unfinished at adjournment in November, 1917. (*A. Y. B.*, 1917, p. 178.) More than 300 proposed amendments were introduced into the Convention, referred to its committees for detailed consideration, reported out favorably or unfavorably, and finally acted upon by the Convention itself. Of this number 22 were submitted by the

Convention to the people. Three of these proposed amendments were adopted by the people in 1917 (*A. Y. B.*, 1917, pp. 179, 184); a fourth, the hotly contested initiative and referendum amendment (*A. Y. B.*, 1917, p. 180), was accepted by the Convention in the session of 1917, but not submitted to the people until the following year. The 18 other proposed amendments, submitted to the people in 1918, were elaborated by the Convention at its second session. The titles of these measures, all of which were adopted, and the results of the popular voting thereon appear on a later page of this issue (see *Amendments to State Constitutions, infra*).

The most important of the measures submitted to the people in 1918 (apart from the initiative and referendum measure already described) was that empowering the legislature to provide for the expropriation of land (including water and mineral rights) for the purpose of promoting its conservation, development, and utilization. This measure was designed to enable the state Government, not merely to conserve the natural resources of the state, but also to control their exploitation. Its adoption creates a broader opportunity for the people, through the state Government, to engage in business than exists in any other state of the Union. It will enable them to expropriate land in order to engage in agriculture, forestry (including lumbering), mining, and fishing, and in manufacturing for sale the products thereof. The advocates of this measure believed it would open the way to the widest possible use of the resources of the state in the general public interest. Its opponents denounced it as the grossest piece of state socialism ever put forward in any American state.

No other measures approved by the Convention aroused such determined opposition as these two. Only two of the others evoked any substantial differences of opinion. One of these authorizes the legislature to provide for compulsory voting at elections; the other substitutes biennial for annual elections for governor, members of the legislature, and other state officers. The former is an innovation in the United States; the latter puts an end to a practice which survived in Massachusetts longer than in any other state.

The budget amendment was a compromise between the advocates and the opponents of the executive budget. It provides that the governor shall ascertain the needs of the departments, learn what revenues are available, and present to the legislature each year at the beginning of the session a systematic plan covering both the revenues and expenditures of the ensuing year. Until the general appropriation bill, based on the governor's budget, has been disposed of, the legislature may not pass any other appropriation bill not recommended by him. It may, however, increase, decrease, add, or omit any item in the general appropriation bill, and the governor may subsequently veto or reduce any item. Vetoed items and the amounts by which items have been reduced by the governor may be reenacted by the legislature by a two-thirds vote. This amendment manifestly represents a compromise by which the advocates of the executive budget obtained the substance of their demands. (See also XIII, *Public Finance.*)

The advocates of administrative reorganization were unsuccessful in the Convention. They failed to secure a shorter ballot, the abolition of the elective executive council, or the desired safeguards for the merit system of appointment to the civil service. They were able to obtain only an amendment providing that the legislature within two years shall establish not more than 20 executive departments, and assign to one or another of these each of the hundred or more existing administrative agencies. Thus the administrative reformers were less successful in the Massachusetts Convention than in that of New York three years earlier, but their proposal met with greater favor on the part of the people themselves (*A. Y. B.*, 1915, p. 93).

The remaining measures submitted to the people related to the regulation of billboards, the preservation of ancient landmarks and property of historical interest, adjournment by the legislature in the early part of the session to facilitate the work of committees, the selection of militia officers and the powers of the governor as commander-in-chief, the succession to the office of governor in case of vacancies, the return of bills to the legislature by the governor with recommendations for amendment, the eligibility of women to appointment as notaries public, the retirement of judges by the governor and council on account of age or mental or physical disability, the revocation of franchises, the power of the legislature to establish building zones in cities and towns, the prohibition of the loan of the public credit to private individuals and corporations, and the prohibition of the voting of additional pay to legislators under the guise of compensation for service on recess committees or commissions.

The approval which the proposals of the Convention received at the hands of the people is the best evidence of the wisdom of its work. During the two sessions it put an end to a controversy which had long disturbed the political peace of the state by the elaboration of the so-called anti-aid amendment (*A. Y. B.*, 1917, p. 179). It worked out a well safeguarded, yet effective, procedure for direct legislation by the people, embodying several novel features of high promise. It also worked out plans to give the legislature new and far-reaching powers to engage in public trading and to promote the general welfare by the utilization of the natural resources of the state. It established a modern budget system, and took a forward step towards the reform of state administration. Despite the misgivings of those who thought a period of war was no time for constitutional reform, the Convention went about its work resolutely and deliberately, greatly to its own

STATUS OF POPULAR GOVERNMENT

State[1]	Woman Suffrage	Initiative and Referendum[3]	Recall[5]	Direct Primary[8]	Presidential Preference Primary
New England					
Me..	....	1908[3]	....	1911	....
N. H.	....	....	....	1909	1913
Vt...	....	....	....	1915	1915
Mass.	....	1918	....	1911	1912
R.I..	1917[2]	....	....	....	....
Conn.	....	....	....	....	....
Middle Atlantic					
N. Y.	1917	....	....	1913	1913
N. J..	....	....	....	1911	1911
Pa...	....	....	....	1913	1913
East-North-Central					
Ohio.	....	1912	....	1908	1913
Ind..	....	....	....	1915	1915
Ill...	1913[2]	....	....	1910	1912
Mich.	1918	1913	1913[5]	1909	1912
Wis..	....	....	....	1903	1911
West-North-Central					
Minn.	....	....	....	1912	1913
Iowa.	....	....	....	1907	1913
Mo..	....	1908	....	1907	....
N.D.	1917[2]	1914	....	1907	1911
S.D..	1918	1898[3]	....	1907	1912
Neb..	1917[2]	1912	....	1907	1911
Kan..	1912	....	1914[6]	1908	....
South Atlantic					
Del..	....	....	....	....	....
Md..	....	1915[4]	....	1910	1912
Va...	....	....	....	1912	....
W.Va.	....	....	....	1915	....
N.C..	....	....	....	....	1915
S.C..	....	....	....	P.R.[8]	....
Ga...	....	....	....	P.R.[8]	....
Fla..	....	....	....	1913	....
East-South-Central					
Ky...	....	....	....	1912	....
Tenn.	....	....	....	1909	....
Ala..	....	....	....	P.R.[8]	....
Miss.	....	....	....	1912	....
West-South-Central					
Ark..	1917[9]	1910	....	P.R.[8]	....
La...	....	....	1914[5]	1912	....
Okla.	1918	1907	....	1908	....
Tex..	1918[9]	....	....	P.R.[8]	....
Mountain					
Mont.	1914	1906[3]	....	1912	1912
Idaho	1896	1912[3]	1912[5]	1909	....
Wy..	1869	....	....	1911	....
Col..	1893	1910	1912[7]	1910	....
N.M.	....	1911[4]	....	....	....
Ariz.	1912	1911	1911[5]-12	1909-12	....
Utah.	1896	1903[3]	....	....	....
Nev..	1914	1904[4]-12	1912	1909	....
Pacific					
Wash.	1910	1912[3]	1912[5]	1907	....
Ore..	1912	1902	1908	1904	1910
Cal..	1911	1911	1911	1909	1911
Total	21	21	10	42	21

[1] States are arranged by geographical divisions according to the classification of the U. S. census. [2] Women may vote for presidential electors and local officers, and for state officers if the office is created by statute. [3] In six of the 21 states possessing the initiative and referendum, the initiative applies to statutes but not to constitutional amendments, viz., Maine, South Dakota, Montana, Idaho, Utah, and Washington. [4] The referendum only. [5] In four of the ten states possessing the recall, it does not apply to judges, viz., Michigan, Louisiana, Idaho, and Washington. [6] The recall applies also to appointive officers. [7] The recall applies also to judicial decisions. [8] In those states indicated by P.R. the direct primary is conducted under the rules of the Democratic party, but is not established for all parties by statute. [9] Women may vote at primary elections only.

credit and the profit of the Commonwealth.

Other State Constitutional Conventions.—The new constitution adopted by the Arkansas Constitutional Convention which met in December, 1917, was submitted to the people in December, 1918. The principal provisions were those providing for woman suffrage and prohibition, and substituting a more conservative form of the initiative and referendum for that already established in Arkansas. The new constitution was rejected by the people. The New Hampshire Convention met in June but immediately adjourned until after the war. The people of five states, Idaho, Illinois, Nebraska, North Carolina, and Washington, voted in November on proposals to call constitutional conventions. The call was approved in two of these states, Illinois and Nebraska. Thus the period immediately after the war seems likely to witness a resumption of the process of state constitutional reform, interrupted, except in Massachusetts and Arkansas, by the call to arms.

Woman Suffrage.—The people of four states, Louisiana, Michigan, Oklahoma, and South Dakota, voted in November on proposals to extend the suffrage to women. But the principal object of the women suffragists in 1918 was the adoption of the Susan B. Anthony amendment to the Federal Constitution. On Jan. 10 the House of Representatives adopted the amendment by a vote of 274 to 136. Of 206 Democrats present and voting, 104 were in favor of the amendment and 102 were opposed. Of 198 Republicans present and voting, 165 were in favor and only 33 were opposed. Of the other members present and voting (Progressives, Prohibitionist, Socialist, and Independent), five were in favor and one opposed. The proposed amendment then went to the Senate, where after a long delay and two abortive attempts to secure action, it finally came to a vote on Oct. 1. It was rejected by a vote officially recorded as 53 for and 31 against. Actually, making due allowance for absent Senators who were paired and for one Senator who changed his vote in order to move reconsideration, the Senate was divided 62 to 34, two less than the constitutional two-thirds majority required for adoption. Of those in favor of the amendment, 32 were Republicans and 30 Democrats. Of those opposed, 12 were Republicans and 22 Democrats.

During the months preceding the vote in the Senate, there had been much lobbying for and against the amendment and many private polls of the Senate. Every effort was made to win over the few votes necessary for victory. At the last moment the President himself appeared before the Senate and made a special plea for the passage of the amendment on the ground that it had become a war measure, but was unable to change any votes at that time. Immediately after the defeat of the measure, the Senator in charge moved to reconsider. This motion was carried, and the advocates of equal suffrage at once inaugurated a campaign to defeat those Senators, standing for reelection, who had opposed their amendment, especially those who had been appointed to fill the places of deceased Senators, and who would not reappear at the short session, meeting in December, if defeated. This campaign was vigorously prosecuted, and was so far successful that the adoption of the amendment by the newly elected Congress, if not by the expiring Congress at its winter session, seemed assured.

In the state elections equal suffrage was adopted in Michigan, Oklahoma, and South Dakota, but was defeated in Louisiana. The progress of the suffrage movement to date, and also of other progressive movements, is shown in the accompanying table.

AMENDMENTS TO STATE CONSTITUTIONS

On the following pages are given brief digests of the constitutional amendments submitted to the people of the various states during the year 1917, with the official returns of the votes thereon, and amendments pending before or passed by the state legislatures for submission in a subsequent year. Many of the important amendments are discussed in detail in other departments of the YEAR BOOK; full references will be found in the Index.

Arizona.—Submitted Nov. 5:

Amending Art. IV, Sec. 2, providing for equitable apportionment according to population of members of the Lower House of the Legislature. Initiated. Adopted, 17,564 for, 10,688 against.

Amending Art. X, Sec. 10, authorizing the legislature to provide for the sale and lease of state lands. Initiated. Adopted, 16,372 for, 10,867 against.

Amending Art. X, Sec. 11, limiting the sale of agricultural and grazing lands. Initiated. Adopted, 14,379 for, 11,179 against.

Arkansas.—Submitted Nov. 5:

Amending Art. VII, Secs. 2 and 3, relating to the constitution and procedure of the Supreme Court. Rejected, 20,721 for, 28,888 against.

Amending Art. XVI, Sec. 1, relating to the issuance of bonds by incorporated towns and cities. Initiated. Rejected, 25,059 for, 24,191 against.

Amending the constitution providing for the loaning of state funds on farm lands, and creating a State Land Board. Rejected, 22,741 for, 27,571 against.

A new constitution drafted by the convention summoned by the Legislature of 1917 (*A. Y. B.*, 1917, p. 182) submitted on Dec. 14, 1918 (see *Popular Government*, *supra*), was rejected by a vote of 23,820 to 37,184.

California.—Submitted Nov. 5:

Amending Art. I, Sec. 14, relating to the condemnation of land for rights of way and the compensation therefor. Adopted, 212,011 for, 179,976 against.

Amending Art. II, Sec. 1, providing for absent voting. Rejected, 189,845 for, 252,387 against.

Amending Art. IV, Sec. 34, creating a State Budget Board and defining its powers and duties. Rejected, 96,820 for, 261,311 against.

Amending Art. VI, Sec. 1, defining the courts vested with judicial power. Rejected, 86,132 for, 274,231 against.

Amending Art. VI, Sec. 4, relating to the constitution and procedure of District Courts of Appeal. Adopted, 188,243 for, 169,803 against.

Amending Art. IX, Sec. 9, relating to the powers of the Board of Regents of the University of California. Adopted, 249,886 for, 148,305 against.

Amending Art. XI, by adding Sec. 7½a, authorizing certain counties to frame charters for consolidated city and county government. Adopted, 195,998 for, 183,610 against.

Amending Art. XI, Sec. 8½, relating to boroughs within consolidated city and county municipalities. Adopted, 179,627 for, 171,735 against.

Amending Art. XI, Sec. 16½, relating to the deposit of public moneys. Adopted, 239,203 for, 180,856 against.

Amending Art. XI, Sec. 18, relating to the indebtedness of the city of Venice. Adopted, 188,349 for, 167,647 against.

Amending Art. XI, by adding Sec. 18½, relating to the funds of Los Angeles County. Adopted, 183,994 for, 178,970 against.

Amending Art. XI, by adding Sec. 20, authorizing excess condemnation of private property for public use. Rejected, 138,131 for, 228,324 against.

Amending Art. XII, Sec. 3, relating to the liability of stockholders and the formation of limited-liability corporations. Rejected, 178,355 for, 196,948 against.

Amending Art. XIII by adding Sec. 1b, exempting cemeteries from taxation. Rejected, 170,296 for, 302,325 against.

Amending Art. XIII by adding Sec. 1b, exempting Y. M. C. A. and Y. W. C. A. buildings and equipment from taxation. Rejected, 166,486 for, 290,573 against.

Amending Art. XIII by adding Sec. 5, reimbursing cities for revenue losses from taxation exemptions for military service. Rejected, 115,727 for, 262,421 against.

Amending Art. XIII by adding Sec. 15, providing for the single tax on land values. Initiated. Rejected, 118,088 for, 360,334 against.

Amending Art. XX, Sec. 21, providing for a complete system of workmen's compensation. Adopted, 229,974 for, 224,517 against.

Amending Art. XX by adding Sec. 22, authorizing the legislature to establish a state system of health insurance. Rejected, 133,858 for, 358,324 against.

Colorado.—Submitted Nov. 5:

Amending Art. V, Sec. 19, shortening the period for introducing bills in the General Assembly. Adopted, 567,693 for, 19,901 against.

Amending Art. XXIII, for reducing cost of legal publication. Adopted, 98,715 for, 12,237 against.

Amending the constitution, to apply the merit system to appointments in the State civil service. Initiated. Adopted, 75,301 for, 41,287 against.

Delaware.—Passed by the legislature of 1917, to be submitted to the legislature of 1919:

Amending Art. III, Sec. 13, relating to the power of the Governor to remove certain officers.

Amending Art. IV, Sec. 4, relating to the time of payment of salaries of the judiciary.

Amending Art. IV, Sec. 11, relating to Orphans' Courts.

Amending Art. XI, Sec. 15, relating to the compensation of members of the General Assembly.

Florida.—Submitted Nov. 5:

Amending Art. XII, Sec. 8, increasing the millage for the support of the public free schools. Adopted, 21,895 for, 10,723 against.

Amending Art. XIX, Secs. 1, 2, and 3, prohibiting the sale of liquors, to be effective January, 1919. Adopted, 21,851 for, 13,609 against.

Georgia.—Submitted Nov. 5:

Amending Art. III, Sec. 2, creating seven new senatorial districts. Adopted, 25,278 for, 10,484 against.

Amending Art. III, Sec. 3, providing for representation in the House of counties not now represented. Adopted, 28,745 for, 6,971 against.

Amending Art. III, Sec. 9, providing for increase in pay of members of the Legislature. Adopted, 24,929 for, 10,862 against.

Amending Art. V, Sec. 2, fixing the salary and expenses of the state treasurer. Adopted, 27,271 for, 8,296 against.

Amending Art. VI, Sec. 1, relating to the judiciary. Adopted, 22,242 for, 8,676 against.

Amending Art. VI, Sec. 13, providing for additional compensation for Superior Court judges of certain circuits. Adopted, 24,679 for, 10,792 against.

Amending Art. VI, Sec. 13, fixing the salaries of the judiciary. Adopted, 26,487 for, 8,353 against.

Amending Art. VII, Sec. 1, relating to pension qualifications. Adopted, 29,047 for, 7,907 against.

Amending Art. VII, Sec. 1, relating to pension qualifications. Adopted, 27,753 for, 8,416 against.

Amending Art. VII, Sec. 2, authorizing exemption from taxation of endowments of institutions of learning. Adopted, 29,731 for, 8,068 against.

Amending Art. VII, Sec. 7, authorizing political subdivisions of the state to incur any new debt with the assent of two-thirds of the qualified voters. Adopted, 27,684 for, 8,240 against.

Amending Art. XI, Sec. 1, creating the county of Atkinson. Adopted, 25,182 for, 10,124 against.

Amending Art. XI, Sec. 1, creating the county of Cook. Adopted, 25,959 for, 9,513 against.

Amending Art. XI, Sec. 1, creating the county of Treutlen. Adopted, 25,505 for, 9,945 against.

Idaho.—Submitted Nov. 5:

Amending Art. IV, Sec. 1, abolishing the office of Superintendent of Public Instruction. Rejected, 22,147 for, 28,268 against.

Amending Art. VIII, Sec. 1, establishing a bonded debt limit of one per cent. of the assessed valuation of taxable property in the state. Rejected, 18,027 for, 26,856 against.

Amending Art. XI, Sec. 4, exempting coöperative associations from the provisions relating to the manner of voting for directors or managers of incorporated companies. Rejected, 12,674 for, 28,321 against.

Amending Art. XII, Sec. 4, permitting counties and municipalities to give financial aid to fair associations not organized for profit. Rejected, 17,472 for, 30,387 against.

A proposal of the legislature for the calling of a constitutional convention submitted at the same election was rejected by a vote of 16,442 to 36,351.

Illinois.—A proposal of the Legislature for the calling of a constitutional convention submitted on Nov. 5 was approved by a majority of 74,239½.

Indiana.—Passed by the legislature of 1917, to be submitted to the legislature of 1919:

Amending Art. II, Sec. 15, extending the suffrage to women.

Amending Art. XV, Sec. 2, providing that the term of office or salary of any officer, fixed by the constitutional law, shall not be increased during the term for which such officer was elected or appointed.

Kansas.—Submitted Nov. 5:

Amending Art. V, Sec. 1, restricting the suffrage to citizens of the United States. Adopted, 238,453 for, 91,617 against.

Amending the constitution providing for a permanent income for the state educational institutions. Adopted, 234,858 for, 101,569 against.

Kentucky.—To be submitted in 1919:

Amending the constitution, prohibiting the manufacture or sale of intoxicating liquors.

Louisiana.—Submitted Nov. 5:

Amending Art. 108, relative to district judges. Adopted, 21,165 for, 6,385 against.

Amending Art. 118, relating to juvenile courts. Adopted, 20,460 for, 5,373 against.

Amending Art. 130, relative to judicial officers for the parish of Orleans. Adopted, 20,712 for, 5,265 against.

Amending Art. 140, relative to the criminal courts of the city of New Orleans. Adopted, 21,242 for, 5,915 against.

Amending Art. 198, exempting soldiers and sailors from the payment of poll taxes. Adopted, 27,606 for, 4,588 against.

Amending Art. 257, relative to the state educational institutions and their maintenance. Adopted, 25,416 for, 5,235 against.

Amending the constitution, limiting the state tax rate to three mills, and local tax rates to five mills. Adopted, 29,103 for, 4,996 against.

Amending the constitution, levying a special tax of 1½ mills for the support of public schools. Adopted, 28,248 for, 5,585 against.

Amending the constitution, requiring each parish and the city of New Orleans to levy annually a 1½-mill tax for the support of public schools. Adopted, 26,873 for, 5,634 against.

Amending the constitution, making provision for the maintenance of state educational institutions. Adopted, 26,074 for, 5,585 against.

Amending the constitution, granting the city of New Orleans an extension of time for the construction of a bridge or tunnel across the Mississippi river. Adopted, 24,031 for, 4,806 against.

Amending the constitution, providing for the construction and maintenance of certain state highways. Adopted, 23,013 for, 5,367 against.

Amending the constitution, authorizing the use of navigable streams and deserted river beds for reservoir purposes by hydro-electric corporations. Adopted, 23,354 for, 4,695 against.

Amending the constitution, extending the suffrage to women. Rejected, 19,573 for, 23,077 against.

Maryland.—Submitted Nov. 5:

Amending Art. I by adding Sec. 1a, providing for absent voting. Adopted.

Massachusetts. — The following amendments were submitted by the Constitutional Convention on Nov. 5 (see *Popular Government, supra*):

Amending the constitution, providing for the initiative and referendum and repealing Arts. IX and XLII of the Amendments. Adopted, 170,646 for, 162,103 against.

Amending the constitution, authorizing the condemnation of lands, including water and mineral rights, for the conservation and development of natural resources. Adopted, 172,111 for, 102,768 against.

Amending the constitution, providing for the regulation of advertising in public places. Adopted, 193,925 for, 84,127 against.

Amending the constitution, providing for the preservation of property of historical and antiquarian interest. Adopted, 183,265 for, 81,933 against.

Amending the constitution, relating to adjournments of the General Court. Adopted, 147,104 for, 100,552 against.

Amending Chap. II, Sec. I, Art. 10, relating to the appointment and removal of military and naval officers. Adopted, 155,649 for, 91,686 against.

Amending Chap. II, Sec. I, Art. 7, relating to the powers of the governor as commander-in-chief. Adopted, 155,114 for, 84,822 against.

Amending Chap. II, Sec. III, Art. 6, relating to the succession in cases of vacancy in the offices of governor and lieutenant-governor. Adopted, 172,125 for, 78,245 against.

Amending the constitution, providing for the return of bills by the governor with recommendations for amendment. Adopted, 164,499 for, 76,972 against.

Amending Art. IV of the Amendments, making women eligible to appointment as notaries public. Adopted, 153,315 for, 105,591 against.

Amending Part II, Chap. III, Art. I, relating to the retirement of judicial officers by the governor. Adopted, 156,796 for, 86,023 against.

Amending the constitution, making charters, franchises, or acts of incorporation forever subject to revocation and amendment. Adopted, 161,833 for, 79,787 against.

Amending the constitution, empowering the General Court to establish building zones in cities. Adopted, 161,214 for, 83,095 against.

Amending the constitution, providing for compulsory voting. Adopted, 134,138 for, 128,403 against.

Amending the constitution, relating to the borrowing of money and prohibiting the lending of the credit of the state to any private corporation. Adopted, 153,972 for, 90,233 against.

Amending the constitution, providing for a budget system. Adopted, 155,738 for, 81,302 against.

Amending the constitution, providing for biennial elections of state officers, senators, and representatives. Adopted, 142,868 for, 108,588 against.

Amending the constitution, relating to the appointment of members of the General Court to office and service upon recess committees. Adopted, 152,800 for, 87,009 against.

Amending the constitution, providing for the reorganization of the executive and administrative work of the state. Adopted, 158,394 for, 81,586 against.

Michigan.—Submitted Nov. 5:

Amending Art. III, Sec. 1, extending the suffrage to women. Adopted, 229,790 for, 195,291 against.

Amending Art. XVII, Sec. 3, providing for the printing of constitutional amendments and other special questions on a single ballot. Adopted, 317,070 for, 90,744 against.

To be submitted on April 2, 1919:

Amending Art. XVI, Sec. 11, to repeal the prohibition of the manufacture, importation and sale of intoxicants. Initiated.

Minnesota.—Submitted Nov. 5:

Amending Art. XV by adding Sec. 6, prohibiting the manufacture, sale, or importation of intoxicating liquors after July, 1920. Rejected, 189,547 for, 173,615 against (lacked majority of vote cast at election).

Mississippi.—Submitted Nov. 5:

Amending Sec. 112, to provide for the classification of property for purposes of taxation. Rejected, 6,502 for, 22,426 against.

Amending Sec. 117, to lower the age qualification of the governor from 30 to 21 years. Rejected, 4,193 for, 24,873 against.

Missouri.—Submitted Nov. 5:

Amending Art. IX, Secs. 16 and 17, authorizing cities of 100,000 population to frame their own charters. Initiated. Rejected, 95,197 for, 280,839 against.

Amending Art. X, Sec. 11, limiting the rates of taxation in counties, cities and school districts. Rejected, 90,637 for, 297,118 against.

Amending Art. X, Sec. 12a, permitting cities to incur additional indebtedness for highway improvement. Rejected, 88,246 for, 286,886 against.

Amending Art. X by adding Sec. 22a, providing for an additional state tax of 10 cents per $100 assessed valuation, for road purposes. Rejected, 81,610 for, 293,101 against.

Amending Art. X by adding Sec. 23, permitting road districts to levy a special tax not exceeding 75 cents per $100 assessed valuation for road purposes when approved by a majority of the qualified voters. Rejected, 94,142 for, 287,488 against.

Amending Art. X by adding a section limiting sources of revenue to taxes on land values exclusive of improvements, excise taxes, and income and inheritance taxes. Initiated. Rejected, 80,725 for, 373,220 against.

Amending Art. XI, Secs. 6 and 7, providing funds for the maintenance of public schools. Rejected, 93,392 for, 289,269 against.

Amending Art. XIV by adding Sec. 13, creating a Homestead Loan Fund. Initiated. Rejected, 102,452 for, 290,207 against.

Amending the constitution, prohibiting the manufacture, sale and giving away of intoxicating liquors after Nov. 1, 1919. Rejected, 223,618 for, 297,582 against.

Montana.—Submitted Nov. 5:

Amending Art. XII, Sec. 2, providing that evidence of debt may be exempt from taxation. Adopted, 55,284 for, 30,607 against.

Nebraska.—Submitted Nov. 5:

Amending the constitution, extending the suffrage to women. Adopted, 123,292 for, 51,600 against.

A proposal of the legislature for the call of a constitutional convention submitted at the same election was approved by a vote of 121,830 to 44,491.

Nevada.—Passed by the Legislature of 1917, to be submitted to the Legislature of 1919:

Amending Art. VI, Sec. 4, authorizing the calling of a district judge to the Supreme Court bench in case of inability of a Justice of the Supreme Court to sit in any cause.

New Hampshire. — The Constitutional Convention authorized in 1916 assembled on June 5 and adjourned without action.

New York.—Submitted Nov. 5:

Amending Art. VII, Secs. 4 and 11, relating to the period and payment of debts contracted by the state. Adopted, 780,099 for, 285,977 against.

Amending Art. VII, Sec. 7, relating to the construction of state highways in the forest preserve. Adopted, 756,894 for, 337,257 against.

Amending Art. VII, Sec. 8, relating to the sale or lease of a certain portion of the Erie Canal. Adopted, 722,235 for, 310,992 against.

Passed by the Legislature of 1917, to be submitted to the Legislature of 1919:

Amending Art. I, Sec. 7, relating to the condemnation of private property for public use.

Amending Art. I, Sec. 7, relating to the drainage of swamp or agricultural lands.

Amending Art. II, Sec. I, prescribing literacy test for voters.

Amending Art. II, by adding Sec. 1a, providing for absent voting.

Amending Art. II, Sec. 4, relating to the enactment of election and registration laws.

Amending Art. III, Sec. 6, relating to the salary and traveling expenses of members of the Legislature.

Amending Art. III, Sec. 18, prohibiting the introduction of private or local bills in certain cases.

Amending Art. III, Sec. 18, relating to private and local bills.

Amending Art. XII, Sec. 1, and Art. III, Secs. 26 and 27, empowering the Legislature to grant a larger measure of home rule to cities and counties, and relating to the form of government of cities and counties.

Amending Art. V, Sec. 9, relating to the preferential employment and promotion of honorably discharged soldiers, sailors and marines.

Amending Art. VI, Sec. 7, relating to the compensation of judges of the Court of Appeals.

Amending Art. VI, Sec. 18, relating to the establishment and jurisdiction of children's courts and courts of domestic relations.

Amending Art. VII, Sec. 7, relating to the use of lands and timber in the forest preserve for domestic fuel and for roads and trails.

Amending Art. VII, Secs. 2, 4, 5, 11 and 12, relating to debts contracted by the state.

Amending the constitution by adding Art. VIIa, relating to the assessment of real property.

North Carolina.—Submitted Nov. 5:

Amending Art. V, Sec. 3, exempting homestead notes and mortgages from taxation under certain conditions. Adopted, 79,946 for, 19,846 against.

Amending Art. IX, Sec. 3, increasing the school term from four to six months. Adopted, 122,062 for, 22,095 against.

A proposal of the legislature for the calling of a constitutional convention submitted at the same election was rejected.

North Dakota.—Submitted Nov. 5:

Amending Art. II, Sec. 25, relating to the number of electors required to propose measures by initiative petition and the repeal or amendment by the legislature of measures approved by popular vote. Initiated. Adopted, 47,447 for, 32,598 against.

Amending Art. II, Sec. 67, relating to emergency measures. Initiated. Adopted, 46,121 for, 32,507 against.

Amending Art. VII, Sec. 135, relating to the voting privileges of members of coöperative corporations. Adopted, 49,392 for, 32,053 against.

Amending Art. XI, Sec. 176, relating to the exemption of personal property from taxation. Initiated. Adopted, 46,833 for, 33,921 against.

Amending Art. XI, Sec. 177, authorizing a state system of hail insurance and an acreage tax on land for this purpose. Initiated. Adopted, 49,878 for, 31,586 against.

Amending Art. XII, Sec. 182, extending the debt limit of the State. Initiated. Adopted, 46,275 for, 34,235 against.

Amending Art. XII, Sec. 185, authorizing the State or any of its subdivisions to make internal improvements or engage in any industry not specially prohibited. Initiated. Adopted, 46,830 for, 32,574 against.

Amending Art. XV, Sec. 202, relating to the amendment of the constitution and the initiation of constitutional amendments by the people. Initiated. Adopted, 46,329 for, 33,572 against.

Amending Sec. 89, providing that no law of the state shall be declared unconstitutional unless at least four judges of the Supreme Court concur. Adopted, 52,678 for, 28,846 against.

Amending the constitution, authorizing the creation of a state system of hail insurance and taxation therefor. Adopted, 52,475 for, 30,257 against.

The ratification of five of the amendments initiated by the Non-Partisan League is being contested on the ground that they did not receive a "majority of all votes cast in the election" (94,055), as provided by the constitution.

Passed by the Legislature of 1917, to be submitted to the Legislature of 1919:

Amending Art. V, Sec. 121, extending the suffrage to women.

Amending Art. VIII, Sec. 162, relating to the investment of school funds.

Amending Art. II, Sec. 177, relating to the taxation of improvements on land.

Amending Art. XIX, Sec. 215, changing the name of the State Reform School to State Training School.

Ohio.—Submitted Nov. 5:

Amending Art. II, Sec. 1, reserving to the people the power to approve or reject an action of the Legislature ratifying any proposed amendment to the Federal Constitution. Initiated. Adopted, 508,282 for, 315,030 against.

Amending Art. XII, Sec. 2, providing for the classification of property for purposes of taxation. Initiated. Adopted, 336,616 for, 304,399 against.

Amending Art. XII, Sec. 2, providing against double taxation of real estate. Adopted, 479,420 for, 371,176 against.

Amending Art. XV, Sec. 9, prohibiting the manufacture and sale of intoxicating liquors. Initiated. Adopted, 463,654 for, 437,895 against.

Oklahoma.—Submitted Nov. 5:

Amending the constitution, extending the suffrage to women. Adopted, 106,909 for, 81,481 against.

Oregon.—Submitted Nov. 5:

Amending Art. XIV by adding Sec. 4, establishing and maintaining Southern and Eastern Oregon Normal Schools. Rejected, 49,935 for, 66,070 against.

Pennsylvania.—Submitted Nov. 5:

Amending Art. IX, Sec. 4, authorizing the state to issue bonds to the amount of $50,000,000, for the improvement of highways. Adopted.

Amending Art. IX, Sec. 8, relating to the debt limits of municipalities and the borrowing capacity of the city of Philadelphia. Adopted.

Passed by the legislature of 1917, to be submitted to the legislature of 1919:

Amending Art. III, Sec. 16, regulating the payment of moneys from the state treasury.

Amending Art. IX, Sec. 1, providing for the exemption from taxation of certain classes of property.

Amending Art. IX, Sec. 8, relating to the debt limits of municipalities and the borrowing capacity of the city of Philadelphia.

Amending Art. XI, Sec. 16, empowering the legislature to provide for the incorporation of banks and trust companies and to prescribe the powers thereof.

Rhode Island.—Passed by the Legislature of 1918, to be submitted to the Legislature of 1919:

Amending the constitution, providing for absent voting of soldiers and sailors on active service.

South Carolina.—Submitted Nov. 5:

Amending Art. III, Sec. 20, relating to the passage of bills. Adopted.

Amending Art. VIII, Sec. 7, relating to the bonded indebtedness of the city of Abbeville. Adopted.

Amending Art. VIII, Sec. 7, relating to the bonded indebtedness of the city of Orangeburg. Adopted.

Amending Art. VIII, Sec. 7, and Art. X, Sec. 5, exempting the cities of Rock Hill and Florence from the provisions thereof.

Amending Art. VIII, Sec. 17, relating

to municipal bonded indebtedness. Adopted.

Amending Art. X, by adding Sec. 14a, authorizing the city of Charleston to assess abutting property for permanent improvements. Adopted.

Amending Art. X, by adding Sec. 16, empowering the city of Pendleton to assess abutting property for permanent improvements.

Amending Art. X by adding Sec. 17, empowering all incorporated cities and towns to assess abutting property for permanent improvements. Adopted.

Amending Art. X by adding Sec. 19, empowering the city of Abbeville to assess abutting property for permanent improvements. Adopted.

Amending Art. XI, Sec. 5, exempting Greenville County from the limitations imposed by this section. Adopted.

South Dakota.—Submitted Nov. 5:

Amending Art. V, Sec. 7, authorizing the Supreme Court to designate other persons to serve on the Supreme Court bench in place of judges disqualified from sitting in any particular cause. Adopted, 41,540 for, 34,706 against.

Amending Art. VII, Sec. 1, extending the suffrage to women. Adopted, 49,213 for, 28,885 against.

Amending Art. VIII, Sec. 5, prescribing conditions for the disposal of State lands. Adopted, 46,686 for, 21,759 against.

Amending Art. XI, Sec. 2, empowering the legislature to classify property for purposes of taxation, and authorizing the taxing of intangible property and of incomes. Adopted, 50,857 for, 25,010 against.

Amending Art. XIII, Sec. 1, authorizing the State to give its credit to or invest its funds in the stock of corporations organized for the development of natural resources. Adopted, 34,717 for, 27,847 against.

Amending Art. XIII, Sec. 1, authorizing the state to engage in works of internal improvement and to own or lend its credit to corporations organized for this purpose. Adopted, 34,717 for, 27,847 against.

Amending Art. XIII by adding Secs. 10 and 11, empowering the state to engage in the manufacture of cement and cement products. Adopted, 37,996 for, 25,666 against.

Amending Art. XIII by adding Secs. 12 and 13, empowering the state to acquire plants for the development and distribution of electric power. Adopted, 41,539 for, 24,396 against.

Amending Art. XIII by adding Secs. 14 and 15, authorizing the state to engage in the mining, distribution and sale of coal. Adopted, 40,516 for, 24,890 against.

Amending Art. XIII by adding Sec. 16, authorizing the state to engage in works of internal improvement. Adopted, 41,885 for, 24,390 against.

Amending Art. XXI, Sec. 2, increasing the salaries of state officers. Rejected, 26,716 for, 42,710 against.

Amending Art. XXI by adding Sec. 8, empowering the legislature to provide a fund for hail insurance by the taxation of agricultural lands. Adopted, 41,069 for, 25,846 against.

Adding Art. XXIX, authorizing the state to acquire and operate grain elevators, warehouses, flour mills and packing houses. Adopted, 40,536 for, 25,505 against.

Texas.—Submitted Nov. 5:

Amending Art. I, Sec. 10, relating to the rights of accused persons in criminal prosecutions. Adopted.

Amending Art. VII, Sec. 3, providing funds for the maintenance of the public schools and for the supply of free textbooks to pupils. Adopted.

Utah.—Submitted Nov. 5:

Amending Art. XIII, Sec. 3, relating to uniformity of taxation, and exemption therefrom. Adopted, 38,669 for, 13,880 against.

Amending Art. XIII, Sec. 4, relating to the taxation of mines and mining property. Adopted, 35,337 for, 21,436 against.

Amending Art. XXII by adding Sec. 3, prohibiting the manufacture, importation and sale of intoxicating liquors after Jan. 1, 1919. Adopted, 42,691 for, 15,780 against.

Washington.—A proposal of the legislature for the calling of constitutional convention submitted Nov. 5 was rejected by a vote of 55,148 to 58,713.

West Virginia.—Submitted Nov. 5:

Amending the constitution, providing for the establishment of a budget system. Adopted, 51,405 for, 26,651 against.

Wisconsin.—Passed by the Legislature of 1918, to be submitted to the Legislature of 1919:

Amending Art. VII, Secs. 6 and 7, relating to circuit judges.

Amending Art. IV, Sec. 21, relating to compensation of members of the Legislature.

Wyoming.—Submitted Nov. 5:

Amending Art. XIX, Sec. 1, prohibiting the manufacture, importation and sale of intoxicating liquors, after Jan. 1, 1920. Adopted, 31,439 for, 10,200 against.

Amending Art. XV, Sec. 15, authorizing the levy of a special tax on live stock for the purpose of stock protection, inspection and indemnity. Rejected, 22,011 for, 10,499 against (votes necessary for adoption, 22,170).

Amending Art. V, Sec. 6, authorizing the calling of a district judge to the Supreme Court bench in case of inability of a justice of the Supreme Court to sit in any cause. Adopted, 27,510 for, 4,623 against.

COUNTY GOVERNMENT

Clinton Rogers Woodruff

Proposed Consolidation of City and County Governments.—The California Taxpayers' Association proposed in an exhaustive report issued in 1917 on the city and county government of Los Angeles that the two units combine under a single organization which would unify the city planning, highway system, local transportation, public-utility management, sewage disposal, water supply, food control, harbor management, and many aspects of public health and morals. In framing a plan to attain this object, the Association felt the need for a council of moderate size, possibly from 17 to 21 members, whose functions should be legislative only. Concerning the chief executive, the report asserts that he should be chosen by the council; should hold office without definite tenure, and should have power to appoint and dismiss at will all heads of departments, with a few specified exceptions. The plan recommended would realize the ideal of the short ballot in a very thoroughgoing way. By consolidating all the local governments into one, and by vesting all administrative and legislative authority in a council composed of one member from each district or ward, each citizen would exercise all his voting power for local purposes by his ballot for councilman.

Concerning the organization of the judiciary, another interesting proposal was made. At present the electors of Los Angeles county choose 20 Superior Court Judges and a great multitude of justices of the peace. As a remedy for this particular evil the report suggested the election of one or more superior judges and the appointment by them of more superior judges of inferior courts.

The municipalities of Los Angeles County, including the County itself, in the fiscal year ending June 30, 1916, disbursed $32,131,194.58. By adopting the proposed plan of consolidation it was estimated that an annual saving of $2,688,519.00 could be effected in salaries, maintenance and operation expenses, and the purchase of supplies, while at the same time better service would be rendered all along the line and a more representative government established.

A constitutional amendment adopted November 5 will make consolidation on the part of the Bay cities and the County possible.

The amendment provides in substance that a board of freeholders may be elected to prepare a charter for the consolidated city and county, which charter will be submitted to the voters at the same time that the consolidation proposition is submitted. This does away with the general obstacle heretofore in the way—unwillingness on the part of the people to commit themselves to a consolidation without knowing its terms.

County questions including consolidation of city and county are under consideration in Cleveland, Cincinnati, and Santa Fe, N. M. The coming of prohibition bids fair to make county reform a pressing issue in the latter place.

County Reform in Pennsylvania.—A resolution that the next legislature should be urged to pass a bill abolishing the election by the voters of real-estate assessors in each county district and creating in their places one realty assessor with assistants, to be named either by the county commissioners, the county court, or by both in joint conference, was unanimously passed at a convention of county commissioners of Pennsylvania held in Pittsburgh in August. With scores of men estimating property values the commissioners claim the records are far from accurate.

Reports.—Among the more important reports dealing with county government issued during the year are: "County Government of Delaware County, Pennsylvania," by Walter Rhoads White; "A Survey of the Revenue System of Delaware County, Pennsylvania with Special Reference to the Methods of Assessment and Collection of Taxes," by Gordon Watkins; "A County at Work on Its Health Problems," by Joseph J. Weber; "The City and County of Denver," by William B. Guthrie; "Rules of the Los Angeles County Civil Service Commission."

VI. MUNICIPAL GOVERNMENT

CLINTON ROGERS WOODRUFF

CHARTERS

Detroit.—On June 25 Detroit, by a vote of 32,256 to 4,554, adopted a charter containing many radical changes, among them being the substitution of a council of nine members, elected from the city at large and receiving salaries of $5,000 each, for a board of 42 aldermen. This council is required to meet daily as a committee of the whole and at least once a week in regular evening session. Ward lines are to be retained only for assessments, election of constables, choice of jurors, and voting purposes. All city officials are to be chosen at non-partisan primaries and elections. Voters have an initiative and referendum control over the activities of the council and the recall on elective officers. The mayor is responsible for the appointment of all boards and commissions and all removals except of civil-service commissioners, and he is solely responsible for the annual city budget and can pass it over the disapproval of the council unless seven of the nine members vote against him. Tax statements are to be prepared and mailed in advance; buying will be centralized; a public-service bureau of complaints is established; the types and uses of buildings are to be regulated within zones established by the City Plan Commission. To avoid conflict of authority, the building, safety, engineering, and permit departments are to be centralized. The city is allowed to bid on pavement and sewer construction in competition with private concerns and to build and operate brick and creosote-block plants. There will be a trial board in the Police Department to act in matters concerning departmental discipline and a Bureau of Public Safety to enforce traffic ordinances, investigate accidents, etc. A modern welfare commission is created to build and operate storage warehouses for foodstuffs and to work out food problems. At the election on Nov. 5 James Cousens was elected mayor and a majority of the councilmen chosen had the endorsement of the Citizens' League.

Akron. — Akron, Ohio adopted a modern charter on Nov. 5. There will be a mayor and eight councilmen (four elected every two years); these in turn will chose a chief administrator, who for all practical purposes will be a city manager. Ward lines are abolished and party designations eliminated from the ballot. In addition to the initiative and referendum the recall of all elective officials is provided. The creation of a Department of Social Service to look after all matters having to do with the general welfare of the people is another new feature, as is the creation of a Department of Public Utilities to enforce the obligations of public-service corporations and to establish more rigorous rules concerning the granting of franchises. The powers of the City Planning Commission are broadened to control housing and other conditions. The health affairs of the city are placed in a department coordinate with the other major departments.

Milwaukee.—The Common Council of Milwaukee was ordered at the election on April 2 to reduce from 37 to 25 members. Instead of 25 ward aldermen elected biennially for two years and 12 aldermen-at-large elected biennially and serving four years, the Council will consist of 25 ward aldermen only, elected for four-year terms. The change will go into effect with the municipal election in

1920, when the six aldermen-at-large who were elected in 1916 go out of office. The alternative proposition submitted in accordance with the act of the legislature (*A. Y. B.*, 1917, p. 190) was for a council of 18 members consisting of six aldermen-at-large and 12 district aldermen, all aldermen to be divided into groups, and each group to be elected at alternate biennial elections for four-year terms. This proposition had the support of the city's leading civic and business organizations; the other was supported by the Socialist Party, by those who for selfish or sincere reasons favored abolishing aldermen-at-large, and by all who, opposed to any kind of reduction, favored the least reduction when it had been decided at the primaries that a reorganization was to be made. The vote was 25,250 for the latter and 18,333 for the former.

Richmond, Va.—Under the leadership of the Civic Association of Richmond, Va., the charter was further amended at a special election held in the summer of 1918. The amendments abolished the administrative and fire boards chosen by the council. The powers of the mayor were enlarged, particularly in authorizing him to nominate four directors: public welfare, public works, public utilities, and public safety, who with the mayor form an advisory board for the consideration of various questions which it is believed require the consideration of a board rather than of the mayor alone. The directors of finance and law are to be chosen by the council as the city auditor and attorney are now chosen. An executive budget is provided, but the bicameral council is retained.

Baltimore. — Baltimore adopted a new charter on Nov. 5. It is the old charter with a substantial application of the merit system to city appointments, postponed in its operation, however, until Jan. 1, 1920. The reason for the adoption of the old charter was to bring it within the provisions of a constitutional amendment recently adopted, giving to cities and counties in the state large powers of local self-government. By its popular adoption the charter has become an act of local, rather than of state, legislation, and as such, subject to the restrictions of the constitution, it is amendable by the people of the city at any time (see also "Home Rule," *infra*).

Montreal.—Montreal, Canada, has had a new charter given to it by the provincial legislature of Quebec, under which the city will be governed by a mayor, a commission of five members, and a council composed of the mayor and one alderman for each ward. The chief city attorney, city comptroller and the city treasurer are *ex officio* members of the commission and may be dismissed only by a vote of two-thirds of all the members of the Council, and such dismissal shall take effect only if approved by the Lieutenant-Governor in council. The other members of the commission are appointed for four years by the Lieutenant-Governor, who may, however, dismiss them at any time for cause and appoint their successors. The chairman of the commission is designated by the Lieutenant-Governor, his salary being $12,000 per year. The other members of the commission receive $10,000. Three commissioners form a quorum. The chairman or the member presiding in his absence shall vote as commissioner, but shall have no casting vote.

Commission Government.—The list of commissioned-governed cities steadily lengthens, mostly in those states where it is difficult or impossible to secure the city-manager form. In states where municipal home rule prevails very few communities adopt the commission form. The following is a list of the cities adopting it since the list published in the YEAR BOOK for 1917 (p. 190):

	Population 1910
Collingswood, N. J.	4,795
Newark, N. J.	347,469
Rahway, N. J.	9,337
Butler, Pa.	20,728
Sharon, Pa.	15,270
Clarksburg, W. Va.	9,201
East St. Louis, Ill.	58,547
Jerseyville, Ill.	4,113
Alma, Mich.	2,757
Port Washington, Mich.	3,968
St. Johns, Mich.	3,154
Cape Girardeau, Mo.	8,475
Maplewood, Mo.	4,976
Webster Grove, Mo.	7,080
Herington, Kan.	3,273
Owensboro, Ky.	16,011

	Population 1910
Biloxi, Miss	8,049
Hammond, La	2,942
Blackwell, Okla	3,266
Dewey, Okla	1,344
Stillwater, Okla	3,444
Clarendon, Tex	1,946
Lubbock, Tex	1,938
Tulia, Tex	1,216
Weatherford, Tex	5,074
Raymond, Wash	2,450

Three commission-governed cities in Wisconsin, Appleton, Portage and Janesville, abandoned in April the commission after six years' operation under it. According to the best available information the election in none of these cities turned on the merits of the two plans. In Appleton the plan was defeated largely by a combination of the liquor and labor votes; several unions became opposed to the commissioners during a strike among the pulpmakers, and the liquor interests were aroused in part by the organization of a police force which they could not control and by the strict enforcement of the Sunday-closing law. In the other two cities the elections virtually went by default; the commissioners were either too busy or too confident of the success of the plan to organize a campaign for its continuance.

Moline, Ill., voted on Dec. 3 to abandon the commission form; here also the result was due to the action of a disgruntled minority and the indifference of a satisfied majority.

Lynn, Mass., is another city which has abandoned the commission form of government. According to the *National Municipal Review*, each commissioner was elected as a specific department head and the legislative feature was entirely forgotten. The consequence was there were five little mayors. The personnel of the government for the seven years Lynn was under commission was excellent. The human equation prevented better results. In the new government of mayor and 11 councillors the mayor is given almost as much power as a city manager.

The City-Manager Plan.—The following is a list of the cities adopting the city-manager plan since the list published in the YEAR BOOK for 1917 (p. 191) with the names of the city managers so far as their appointments have been announced:

	Manager	Population 1910
Auburn, Me		15,064
Waltham, Mass	C. A. Bingham	27,834
Auburn, N. Y		34,668
Ambridge, Pa	H. R. Hunter	5,205
Altoona, Pa	H. Gordon Hinkle	52,127
Bethlehem, Pa	W. L. Miller	12,837
Phillipsburg, Pa		3,585
Sewickly, Pa	W. M. Cotton	4,479
Towanda, Pa	Wm. T. Howie	4,281
Norfolk, Va	C. E. Ashburner, Jr.	67,452
Roanoke, Va	William P. Hunter	34,874
Griffin, Ga		7,478
Ocala, Fla	J. C. Caldwell	4,370
Akron, Ohio		69,067
East Cleveland, Ohio	C. M. Osborn	9,179
Gallipolis, Ohio	Edward E. Myers	5,560
S. Charleston, Ohio	P. H. Cheney	1,181
Xenia, Ohio	Kenyon Riddle	8,706
Birmingham, Mich	G. A. Abbott	1,607
Crystal Falls, Mich	J. H. Sanders	3,775
Kalamazoo, Mich	H. H. Freeman	39,437
Ostego, Mich	H. A. McKee	2,812
Royal Oak, Mich	George E. Weitzel	1,071
Three Rivers, Mich	O. O. Johnson	5,072
Wilmette, Ill	Mr. Forester	4,943
Sioux Falls, S. D	Declared unconstitutional	14,094
Boulder, Col	C. O. Heinrich	9,539
Albuquerque, N. M	A. R. Hebenstreit	11,020
Brigham City, Utah	Chas. O. Roskelley	3,685
Fresno, Cal		24,892
Santa Barbara, Cal	R. A. Craig	11,659

The City-Manager Plan in War Communities.—The principle of the city-manager form was applied by the Federal Government to many of its war-time enterprises. The management of these communities involve not only the collection of rents, the supervision of repairs, and maintenance of buildings, but comprise duties analogous to those of a city manager, including responsibility for sanitation, cleanliness, fire and police protection, and the general health and welfare of the inhabitants. These managers will not be permanently attached to one community, but will be transferred and promoted, thus creating a corps of trained experts in community management. Allan Robinson, manager of the operating division, U. S. Housing Corporation, was in charge of this branch of the service. In an address before the National Municipal League, Harrison Gray Otis, the city manager of Auburn, Me., in speaking of "The City Manager Plan as a War Measure," said:

> The Government is using the manager plan at a time when it wants efficiency and speed. In Alaska the governments

of many communities are carried on by United States officers whose duties correspond very closely to those of a city manager. The war has brought out the value of an administrator with centralized authority.

Mr. Otis also pointed out that, in the achievement reports of the city-manager cities as published in the *City Managers' Association Year Book*, city after city undertook various phases of war work in determined and successful manner. Among the different activities which the managers have engaged in are the handling of the fuel question, the housing problem, the planning of cities for after-war growth, and the furnishing of water, electricity, and other services to nearby cantonments.

The simplicity of centralized executive control has allowed economy and efficiency when they are most needed. Among the noteworthy achievements referred to by Mr. Otis, one or two are of special interest:

> Eldorado, Kansas, two or three years ago was a small country community of 3,500 population; it is today a hustling city of 18,000. The development of oil fields has changed it almost over night from a rural village to a wide-awake city. The work of rapid readjustment has been handled admirably by the city manager with the coöperation of the business men on his commission. Kingsport, Tennessee, was organized and incorporated under a commission-manager charter last year. Industrial growth has converted it from a mountain hamlet into a city of 10,000. The results accomplished by its city manager are a tribute to the workableness of the new plan. The city-manager plan stands for business efficiency which makes possible real community service.

Home Rule.—Only a few legislatures were in regular session in 1918 and they took no action on municipal home rule. There was some progress in the application of home-rule principles in some states. The adoption of home-rule charters in Akron and Baltimore has been noted above. Under the provisions of the new Baltimore charter the city will be independent of county aid or obstruction, as it has power to enact or amend the laws on the statutes to serve best its economic and local needs. The Baltimore Annexation Act now gives Baltimore city governmental control over some 50 sq. miles of additional territory and 200,000 additional population. As new laws will have to be enacted for the police and sanitary regulation of this new territory the adoption of the new charter is of special significance and importance.

EFFICIENCY RESEARCH, BUDGETS, AND FINANCE

Standardization of Services and Salaries.—During 1918 the following municipal standardization studies were published:

> "Civil Service Plan for the County of Milwaukee, Including Classification and Standardization of Personal Service, Civil Service Rules and Regulations, and Constructive Recommendations for Positive Employment Administration," prepared on the authorization of the Milwaukee County Board of Supervisors by the Milwaukee County Civil Service Commission. The civil-service act and rules for the Milwaukee County government went into effect and operation on Jan. 1. This report also contains standard specifications for personal service, including services, grades, titles, duties, qualifications, lines of promotion, and compensation of positions in the classified civil service of the County of Milwaukee.
>
> "Classification and Standardization and Description of Duties of Positions in the Classified Service of the City of St. Louis."
>
> "Standard Specifications for Personal Service and Classification of Competitive Positions in the Service of the City of Cleveland."

Municipal Legislation in New Jersey.—The New Jersey Commission for the Revision and Codification of Laws Relating to Municipalities, created by the 1916 legislature, rendered a report to the 1917 legislature as a result of which a so-called home-rule bill was passed (*A. Y. B.*, 1917, p. 197). The Commission was continued by the 1917 legislature, primarily that they might continue the work of revising and codifying the statutes of the state relating to counties as well as other statutes relating to governmental functions of all municipalities. The report of the Commission to the 1918 legislature has been valuable in clearing up the confusing and conflicting statutes relating to counties.

The Commission found, however, that these statutes, although not as numerous as those relating to municipalities, did not lend themselves as easily to codification. The following statement shows something of their problem as the Commission saw it:

> Good county government requires that there should be a governing body with full control over the various departments of the county. This cannot be accomplished in New Jersey without an amendment to the constitution. Our present constitution provides for a number of county officials with power to expend the county funds independent of any direct control and without responsibility to anyone. The board of chosen freeholders, the present governing body, which is responsible to the people of the county for the raising of funds and the expenditures of the county's money, has not proper control over such expenditures.
>
> In many respects the county is not an independent corporation, but merely a division of the state government. The Commission felt that it was not within the scope of its work to revise the laws relating to this phase of county activity. Such laws cover matters which should be under state rather than county control.
>
> The Commission directed its attention principally to the revision and codification of statutes conferring powers on boards of chosen freeholders.

Eleven of the bills passed were repealers and greatly clarify the statutes relating to counties. Among the other advantageous features of the laws as passed was provision for a system of county planning, by which it is made possible to have all the municipalities within a county and adjoining it coöperate in the laying out of roads and boulevards and in the betterment and systematic development of the county. Amendments providing for a change in the procedure relating to the passing of ordinances abolished the different methods of procedure under all other statutes and fixed one method of procedure for all municipalities. Another amendment provided a referendum in the question of fixing salaries of officers of municipalities; a referendum is also provided on the question of fixing the hours of service of police departments. There is also provision permitting municipalities to join with counties in doing certain work. Another amendment provides a method of procedure in appeals from assessments and awards of damages for local improvements.

Municipal Research.—The Dayton Bureau of Municipal Research, established about six years ago, has been discontinued for lack of funds. The board of directors found that owing to manifold financial appeals at the present time, it would be unwise to undertake a money-raising campaign to keep the bureau in operation. Fortunately the purpose for which the bureau was established has been largely accomplished. The local city government under the commission-manager plan is conducting the affairs of the city with such a degree of efficiency that the demand for the bureau is not as imperative as it was a few years ago.

Many reports of great value have been produced by various agencies engaged throughout this country and Canada in the investigation of governmental problems. A few have been printed, but by far the larger number have never been carried beyond the manuscript stage, and in consequence have been of little or no utility beyond the immediate locality in which they were prepared. The result has been duplication in one bureau after another of work already done elsewhere. A Governmental Research Conference has been organized to secure the mutual assistance of its members in eliminating this multiplication of tasks. One means adopted by the Conference is a monthly bulletin showing the character of all work completed or in progress during the preceding month on which a written report is or is to be made. The bulletin is intended to be of temporary use only, and lists only current activities, an item being dropped as soon as note has been made of its completion. As items are dropped from the bulletin they are entered on index cards which are distributed among the members of the Conference. The Conference has established a central office in the bureau of government of the University of Michigan, under the direction of Dr. Robert T. Crane of that institution.

A report upon the business and finance administration of the Harrisburg School District, prepared for the Harrisburg Chamber of Commerce by the New York Bureau of Municipal Research, has been published. A statistical study of 36 American cities, made by the students of Reed College, Portland, Ore., under the direction of Prof. William Fielding Ogburn, is published in *Reed College Record*, No. 27 (Dec., 1917). Wage rates, cost of living, death rates, child labor, church membership, parks, pavements, school attendance and illiteracy are some of the 18 subjects for which numerical and graphical ratings are given The statistics were taken from published sources and range in date from 1905 to 1916. A grand summary gives the rank of the cities. The prefatory note states that "all Western cities are in the first quarter, nearly all Southern cities are in the last quarter, and most cities of other sections are in the middle quarters."

Surveys.—The Russell Sage Foundation made three state surveys during the year. One, entitled "The War Programme in the State of South Carolina," was prepared at the request of Governor Manning; another for the State Council of Defense of West Virginia was based upon a study by C. A. Sonaker on "Institutions and Resources of the State"; and the third outlined a welfare programme for the state of Florida prepared at the request of Governor Catts. During the year the survey movement has been considerably curtailed in its activities and developments by the national mobilization of the forces of the country, but in spite of this situation the following noteworthy surveys have been undertaken and some of them completed: municipal government surveys of Bethlehem, Pa.; Buffalo, Columbus, Ohio, Indianapolis, Jamestown, N. Y.; Kansas City, Mo., Mobile, Montreal, Richmond, Va., and San Francisco; a poice survey of Harrisburg, Pa.; finance surveys of Rochester and Nassau County, N. Y.; charter surveys for Mt. Vernon, N. Y., and Kingsport, Tenn.; charities surveys of Rochester, N. Y.; sickness surveys of Pittsburgh, Chelsea Neighborhood, New York City, and the principal cities of Pennsylvania and West Virginia; a survey of the state employees' pension system of New Jersey; and a survey of the juvenile institutions and courts of New Jersey. A "Survey of the St. Louis Public Schools" has been published in five volumes. The Cincinnati Chamber of Commerce is conducting a series of vocational surveys. Thus far it has published those dealing with the printing and sewing trades.

Budgetary Reform in Los Angeles.—A constitutional amendment permitting the board of supervisors of Los Angeles to call an election for the voters to sanction the taking of money out of the succeeding years' revenues to reimburse the funds that were unlawfully, though not dishonestly, depleted in the years 1914-17 was, in the judgment of a committee of the Los Angeles Municipal League, the only way out of a bad financial muddle. This amendment was adopted on Nov. 5.

This same organization has been working for an executive budget to accomplish the following ends: (1) that responsibility for recommending a complete budget be placed upon the mayor; (2) that the mayor require the head of each department to recommend a budget for such department, not exceeding a sum fixed by the mayor; (3) that intelligent criticism be made possible through the publication of the budget before its adoption; (4) that the careful judgment of able councilmen be had on the adoption of the budget. The City Council, however, without previous warning, refused to submit charter amendments to carry out these ideas.

Fiscal Problems of Cities.—A falling off in miscellaneous revenues, notably those derived from liquor licenses, made it necessary for the Chicago City Council to practice extreme parsimony in making up its 1918 budget. Its finance committee in November, 1917, asked Governor Lowden to call a special session of the Illinois legislature that the corporate tax rate might be substantially increased by law. The governor, foreseeing that either hasty legislation would be rushed through or the money and energy of the state would be taken for a long legislative controversy, told the councilmen that if they would go back and get the agreement of the civic bodies of Chicago and of a substantial majority of the Chicago delegation in the legislature to a definite legislative programme, he then would consider the request. This action gave to the civic bodies a position of responsibility to exert constructive influence at the 1919 session of the legislature.

A most exhaustive treatment of the city's first request for financial assistance was published by the Chicago Bureau of Public Efficiency under the title, "Chicago's Financial Dilemma." It pointed out progressive impairment, to the point of exhaustion, of the city's working capital; criticized an absence of careful analysis on the part of the city of probable revenues, and suggested that the Bureau would be glad to join in a request for emergency relief when the need therefor was stated in budgetary terms and accompanied by a constructive programme of legislation looking toward a permanent improvement in Chicago's financial system. The Chicago Association of Commerce, the Chicago Real Estate Board, and other prominent organizations replied to the city that a more definite and more satisfactory programme would have to be submitted before they could join in asking for a special session to increase municipal taxes. The Council finally passed its appropriation ordinance for 1918 strictly upon a basis of revenues actually in sight, making curtailments where necessary, except that salary increases were granted to all employees receiving $1,800 a year or less. This was made possible by certain citizens who had not taken part in the special-session negotiations and who agreed to advance the $1,757,000 necessary to meet this increase. They will be repaid in judgment vouchers bearing five per cent. interest per annum until redeemed.

Ohio cities are laboring under serious financial conditions. Almost without exception, as D. C. Sowers pointed out in the *National Municipal Review*, the expenditures are in excess of income. Cleveland has had an annual deficit ranging from $300,000 to $900,000 for the past six years with the exception of one. Akron has had a deficit four years out of the past six. The deficit in Cleveland in 1917 was $944,000, and in Akron, $251,000. The situation in these two cities is typical of the general situation. The cause of the present municipal embarrassment is quite generally ascribed to the operation of the Smith one per cent. law which places a 15-mill limit upon the rate of taxation for all taxing districts. The theory upon which this law is based is that with a low rate of taxation it will be possible to secure the listing of all property at its true value for taxation purposes, and that with a full assessment even a low rate will produce funds adequate for all purposes. The immediate effect of the law was to increase greatly tax valuations, but after the first year this increase has not been very large. The total tax duplicate of Ohio in 1915 was $7,537,000,000, and in 1917 it was $7,697,000,000. In some cities an attempt has been made to secure relief through increasing the duplicate, but in no city is property assessed at 100 per cent.

The financial situation of Chicago and Ohio cities differs in detail from other cities, large and small, but not in essence. The war aggravated an already serious situation; civic and commercial bodies have very generally been studying the problems with the hope that the 1919 sessions of the state legislatures may afford some relief, but the prospects are not reassuring.

Municipal Finance and the War.—The year 1917 showed a decided curtailment in the sale of municipal bonds. In January of that year there was a notable rise, but February showed a decline, owing to the uncertainty resulting from the severance of diplomatic relations with Germany. The outbreak of war strengthened this feeling and the decline continued throughout the year. November reports of the *Bond Buyer* stated that values in that month reached the lowest point in 25 years. In January, 1918, they went even lower. The demand for municipal bonds, however, did not cease, owing first to the safety of the securities and second to the fact that they are tax-exempt under the income-tax law. This feature caused resentment in Washington and doubtless would have been changed were it not that it is a serious question whether Congress has the authority to levy taxes on bonds of states or their political subdivisions.

To prevent municipal bonds from competing with loans of the Federal Government action was taken to limit municipal borrowing. The governor of Indiana sent out a letter asking that cities and counties refrain from issuing bonds except for refunding purposes and where needs were for war purposes. The success of this appeal is shown in a statement made before the Investment Bankers' Association in Baltimore, where it was reported that, whereas the bond houses of Indiana usually had several millions of dollars of Indiana municipal bonds, they owned at that time less than $300,000 of such bonds and stated that by cooperation 75 per cent. of municipal financing could be eliminated. Secretary of the Treasury McAdoo, addressing the American Bankers' Association in Atlantic City, urged that the bankers of America study the question of limiting unnecessary expenditure of cities for public works and improvements until after the war.

The result of this request was the appointment of a committee which reported the advisability of establishing a financial priority board to assist the Government in passing upon new security issues. Much of the good of such a board depended on influence exerted upon local officials since legal pressure could not be used. Many of the suggestions of the committee were embodied in the War Finance and Capital Issues Committees established by Congress (see XII, *The Conduct of Business*). The committee expressed the duties of American cities in municipal finance thus:

> It is obviously impossible to suspend all public improvements. Such public financing as may be required for sanitary development and improvement, dock improvements (in many cases subserving the government's interests), temporary financing in anticipation of taxes and certain refunding operations must continue. But the general scope of them should be made to conform to the necessities of the general situation; and in point of time any bond issues by local governmental bodies should be guided so as to avoid conflict with federal bond issues.

The Federal Government and Public Utilities.—In August the Capital Issues Committee addressed a communication to the public-utilities commission and municipal officials of the country calling attention to the creation of the Committee and to the fact that "men, money and material which the Government needs are to be made available for essential war purposes." The statement declared there must necessarily be a considerable degree of sacrifice on the part of individuals, communities and corporations in adjusting themselves to the substitution and changed standards which the situation compels. "Existing facilities must be made to serve in place of new ones regardless of temporary inconvenience and discomfort unless the public health or paramount local economic necessity is involved." The Committee suggested that these considerations apply with marked force to the public-utility situation and announced the opinion of the Committee that extensions and betterments should be postponed until after the war unless an immediate war purpose is served. Moreover, the Committee went to the extent of asking the consideration of the propriety of deferring even the performance of contractual obligations arising from franchises or other local requirements when no military or local economic necessity is served by such expenditures.

Federal Help for East St. Louis.—The production division of the Ordnance Department established a branch to improve or eliminate those community conditions adversely affecting labor engaged in the production of war material. The Illinois supervisor of the branch reported a low standard of civic, social and moral conditions in East St. Louis. As a consequence F. C. Butler, who was in charge of the branch, drew up a plan, programme and budget for the improvement of local conditions. The needed $200,000 fund was arranged for and a committee of 50 formed to represent the War Department and to act as a policy and public sentiment-making body under the direction of a representative of the production division of the Ordnance Department. This programme is probably the most comprehensive thus far undertaken for an American city, according to Mr. Butler, who has every confidence that "if it is carried into effect, it will amount to a complete civic redemption of the city." The programme includes housing, health, municipal survey, clean-up, city planning, industrial welfare, neighborhood work, law enforcement, home defense, gardening, cost of living, recreation, welfare of labor, racial problems, charities, safety, parks and playgrounds, transportation, patriotism, thrift, administration.

CITY PLANNING

Government Recognition of City Planning.—In many ways the year 1917-18 may be considered, in the opinion of Theodora Kimball, in the *National Municipal Review*, the most significant period in American city planning, for in it has come governmental recognition of the fact that in the development of large areas of land for efficient use it is necessary to employ the services of the several professions that heretofore have been coöperating on a lesser scale in city-planning work. The Federal Government has realized that to house 50,000 men in camp or 15,000 workmen and their families in the neighborhood of an industrial center is not merely a question of buildings and sanitary engineering, but that the city planner (who in most cases is the landscape architect trained in the handling of land development) is necessary to adapt the arrangement of roads and buildings and community facilities most effectively to the site and purpose. In 1917 a huge problem was set before the Construction Division of the Army—the building in three months of 16 wooden cities for populations varying from 30,000 to 50,000 men. The Army employed city planners not only in this emergency construction, but it employed them continuously for the period of the war in the laying out of camps for various special purposes, in the laying out of hospitals, and in all other construction work involving numbers of buildings on areas of land.

One thing has been brought home to the world as never before, that on proper physical environment depends the effectiveness of man, in fighting or in industry, and so ultimately the effectiveness of the nation. In all plans for reconstruction, in such a document as the notable reconstruction report and subsequent resolutions of the British Labour Party, it is recognized that after-war improvement of the environment of the average citizen is absolutely essential to national happiness and prosperity. On what a scale this improvement should take place is indicated in Thomas Adams' "Rural Planning and Development for Canada," a report of general interest, a treatise on national planning which should have great influence on city and national planning in the United States and speed the time when we shall survey and apportion all our vast natural resources to their most effective use. The appearance of this report should be recorded as an event in the history of American planning.

Zoning.—In addition to the advances in recognition of city planning occasioned by the war, the most important progress of the year has unquestionably been in the field of districting or zoning. The fundamental relation between the street plan and the apportionment of the city area into districts according to use has become more clear, and the very great economies to be effected, as well as the amenity to be secured, are convincing American cities that districting is worth while. With New York City in the East as leader and its building-zone ordinance as a model to be followed or varied from, and with California possessing a state zoning act "broader in scope and affording greater protection than any other existing act in the United States," the movement is seen to be country-wide. Baltimore is embarking on a campaign for districting regulations, and St. Louis has published a full set of maps to accompany the ordinance drawn up by the City Plan Commission and passed by the Board of Aldermen in June. A New York state law now makes it possible for cities other than New

York City to secure the same power for districting. In spite of several minor legal setbacks, there is a strong general tendency to recognize the validity of the districting principle, and its ultimate place in our regular municipal programme seems assured.

The cities now having zoning schemes are New York, St. Louis, Los Angeles, Fresno, Berkeley, Minneapolis, and Alameda. Of their ordinances, those of Los Angeles and Minneapolis refer only to the use to which buildings may be put. The Minneapolis ordinance affects only parts of the city. The New York, St. Louis, Berkeley, Fresno, and Alameda ordinances regulate the height, use, and area of buildings. In addition to these cities, Boston and Washington have a comprehensive system of districts limiting the height of buildings; these two cities, however, do not regulate the use or area of buildings by districts. Besides Baltimore, Newark, N. J., and Cleveland are actively contemplating the adoption of zoning schemes.

The Plan of Washington.—The effect of the war emergency construction of the past year on the plan of Washington has been a subject of grave concern. It is encouraging to see in the reports of the Commission of Fine Arts that the plan is none the less cherished and future permanent building developments carefully worked out in accordance with it. The same appears in the "Report on Public Buildings" of the Public Buildings Commission appointed in 1916 with a view to providing ultimately permanent quarters for all the Government activities in buildings owned by the Government. The Commission of Fine Arts reports for 1916 and 1918, both published within a year, review progress on the Park Commission plan of Washington since the founding of the Commission in 1910; the 1918 report contains the recommendations made by the Commission during the preparation of the Public Buildings Commission report, and also the Commission's report on the relocation of the Botanic Garden with the discussion of proposed sites. As Miss Kimball says, to read the reports of the Commission is to realize again that in our capital city we have our most worthy city-planning monument, and that whatever ignorance and special interests may attempt to its detriment, its development is continuously watched over with the greatest of understanding and skill.

City Planning in California.—The *Architect and Engineer* of California for June, 1918, prepared under the direction of Charles H. Cheney, secretary of the California Conference on City Planning, is a stocktaking of city planning in that state. In addition to the progress in districting made by Berkeley and Fresno, the appointment of a permanent City Planning Commission for San Francisco is recorded, as is work on city plans for Pasadena and Alameda (the latter especially urgent on account of the shipbuilding plants); transportation plans involving Los Angeles on the one hand and Oakland, Alameda and Berkeley on the other, now before the state Railroad Commission, the decision of which is final on such matters, thus making the Commission an ultimate city-planning authority; and the establishment of a state bureau of city planning under the Commission of Immigration, with functions analogous to the Massachusetts Homestead Commission and to the Bureau of Municipalities, with its recently appointed city-planning engineer, of the state of Pennsylvania.

City-Planning Reports.—The group of the St. Louis City Plan Commission reports (Harland Bartholomew, engineer) shows great activity in that city. "Problems of St. Louis" is a description, from the city-planning standpoint, of past and present tendencies of growth with general suggestions for impending issues and necessary future improvements. The "Major Street Plan for St. Louis," taken together with the later zoning plans, points out the main lines of city development and growth, and the "Recreation" report (November, 1917) comprises a thorough study of the situation, with plans for a systematic rounding out of the public park and recreation system. "Zoning for St. Louis" prepared the way for the official zoning maps and the ordinances already referred to. In addition, an industrial survey of St. Louis by the firm of Goodrich, Hoover & Bennett (New York) has been going forward.

Omaha, Neb., and Davenport, Iowa, have both published studies for comprehensive plans. In the case of Omaha the consulting experts were George B. Ford, E. P. Goodrich, and the late Charles Mulford Robinson. A careful survey by them has been made the basis of recommendations which the commission sets forth. The Davenport studies have particular interest because of the growth of Davenport and adjacent cities as a great center of war industries. One of the U. S. Housing Corporation projects was located there.

"The Plan of Minneapolis" expected in 1914 has come out in sumptuous form, similar to the Chicago report of 1909, in which Mr. Bennett collaborated with the late Mr. Burnham, who was concerned with the beginnings of this Minneapolis plan. Only one of Bion J. Arnold's reports has appeared in the last year—that for Syracuse. As usual in his reports the intimate relation of the transportation problem to the city plan is fully recognized. In this case the railroad-crossing situation has tied up city development, and its solution will make for essential improvement.

Philadelphia, now the national center of the shipbuilding industry, is fortunate in having comprehensive plans for development already far advanced. In 1917 the permanent committee on comprehensive plans published a "Report on the Revision and Extension of the Street System in Southwest Philadelphia," based on an extensive study made by the general plans division of the Bureau of Surveys. This report is parallel to the South Philadelphia report of 1913 and proposes waterfront reclamation for industrial and housing purposes.

City-Planning Conferences. — The tenth national conference on city planning was held by the American City Planning Institute in St. Louis, May 27-29. The new cities either created or being created by the Federal Government naturally formed the chief topic of the entire convention. At the conference in Kansas City a year previously, a resolution was adopted directing President Frederic Law Olmsted to offer the services of the Institute to the Government. The president's address was a report of the result of the offer. Member after member of the conference had his services drafted in the creation of these towns. The resulting influence promises to be great. In 15 months of war demands the cause of town planning and of housing has been advanced more that 15 years of peace would have advanced it.

A resolution was passed urging the Government to adopt the principle of developing war towns as units, instead of buying individual lots here and there; in the latter case no adequate and self-sufficient town plan could be carried out. Another resolution urged the preparation and adoption of municipal and state plans for improvements to be prosecuted immediately on the ending of the war. It was pointed out that the preparation and adoption of such plans as a rule requires more than a year, and an equally long time is taken by the legal processes necessary to acquire the ground or public rights of way upon which the improvements are to be placed. If, therefore, no action was taken before the war ended, public work would not be available for months afterwards to relieve problems of unemployment that might be caused by the return of millions of soldiers and the slowing down or closing of war industries, throwing more millions of men out of work (see also XIV, *Unemployment*).

HOUSING

Housing Progress in War Time.—The pre-war boom towns—Bridgeport, Flint, Hopewell, Penns Grove—forced us to take new factors into our housing calculations. The virtual cessation of immigration from Europe and the migration of our native population to war-industry centers, which reached a dramatic phase in the great negro migration of 1917, introduced new values. Our entrance into the war greatly increased this movement of native population. Certain sections of the country, because of location, natural resources, or established industries fitted to supply war essentials, drew workmen by the thousands and in some cases by the hundred thousands. At the same time the construction of new dwellings virtually ceased. Housing shortages in the war-industry centers became acute and private means were unable to meet the need. Yet unless the need were met, essential industries would halt because of lack of workers. We were compelled to think not in terms of a single manufacturing concern, even though it was as large as the U. S. Steel Corporation, which built large towns, nor even in terms of a great industrial community like Philadelphia, but in terms of a nation suddenly called upon to utilize all its resources to the utmost.

This change is not much reflected in reports recently issued. As John Ihlder points out in the *National Municipal Review*, we have been going too fast to write many reports or to have them anything but antiquated by the time they are published. Two years ago we were issuing old-time reports; even in 1918 an occasional one appeared from some still comparatively unhurried community, as that written by Robert E. Todd for the Des Moines Housing Commission. This report, like the one on New Amsterdam, N. Y., written by Udetto D. Brown, and that prepared for the city commission of Portland, Ore., of which a summary is published in the *Oregon Voter* of July 20, 1918, raises again the old wonder how the citizens of a community can read such descriptions and not act. But the reports of the last two years are largely written in the work itself.

Suddenly aroused to the need of more and better housing, the dynamic business element set itself to secure new dwellings of an improved type. It has become so absorbed in this that it neglects to inquire into the conditions of existing dwellings. Of these efforts Bridgeport, Conn., is still our best example; for there some attention was paid to existing buildings and the housing law was strengthened, even though the greatest attention was given to new construction. Even in Bridgeport, however, the emphasis was so much on one side that the plans for a new "model" apartment house had to be redrawn to comply with the law. Bridgeport had the great advantage of a pre-war boom which concentrated outside attention upon it and brought it criticism and suggestions in plenty. Later towns, like Lockport, N. Y., did not awaken until the housing shortage had begun to become national in its effects, and the efforts of its housing company failed to excite much more than local interest. With the efforts of business groups to meet a need too great for the old-time competitive builder's resources may be classed the latest comers among company villages: Berwin, Tenn., the garden village of the Connecticut Mills Co., Sawyer Park at Williamsport, Pa., the new developments at Dayton and Youngstown and Morgan Park.

How fast we are moving in housing is indicated by the *Proceedings* of the National Housing Association meeting held in October, 1917, and by the symposium on war housing held in Philadelphia in February, 1918. The former volume has more than an historic interest, for it contains discussions on permanent questions. We are still concerned as to which department of the city government shall enforce housing laws, for city governments still have their old powers over existing dwellings and even over new dwellings not built by a Federal agency. But the symposium, held four months later, shows the great change in the housing problem. It was not a meeting with prepared papers but a record of snap discussion. It did not deal with generalizations, but with immediate problems: "To what extent shall war workers be housed in temporary barracks—in permanent homes?" The answer given then was later worked out: "In barracks only until permanent houses can be erected or where the need is temporary." "Shall houses for war workers be rented or sold?" a question that could not be answered. "Is the industry permanent or will it decline after the war, compelling the present tenant to seek work elsewhere while a man of a different trade takes his dwelling?" "Should the wage earner own his home?" The two great Federal agencies engaged in house building, the Emergency Fleet Corporation and the U. S. Housing Corporation, had opposite opinions. Without prejudice to these opinions in general they seem to have agreed that no houses should be sold during the war. Even at the time they were asked these questions as phrased had ceased to be pertinent.

Housing Standards.—Most of the war-time changes in housing, great as they were, only partially prepared for them as we were, are encouraging. The war emphasis was all on the side of construction. In that we were able to secure the acceptance of good standards through the adoption of "Standards Recommended for Permanent Industrial Housing Developments" by the U. S. Housing Corporation (described by Lawrence Veiller in *Housing Betterment* for May), as well as through the work in both the Housing Corporation and the Emergency Fleet Corporation of architects and housing specialists who knew the importance of standards. It was in the field of local government regulation that we had cause for most inquietude. Even in New Jersey, where the Board of Tenement-House Supervision has increased its work, there is no indication given by the latest annual report that the Board realizes its new duties and new opportunities, for New Jersey at its northern and southern extremities comes within two of the great war-industry districts. In New York a recent proposal by real-estate interests that the Tenement House Department be abolished as a measure of economy and on the plea that it has done its work was answered by a former commissioner by quoting figures showing the needs of the normal civil population. In Philadelphia, where the health of a vastly increased working population was of immediate and vital concern to the nation, the work was under the supervision of temporary appointees and no attempt was made to do more than simply go through the established routine.

In contrast to these cities was Buffalo, not for what it accomplished, but because its health and housing officials saw their task in its true relation to our national programme and desired to do their full duty. Buffalo is a war-industry center. The Health Department, under which is the enforcement of housing regulations, made a thorough study of the situation which showed definitely the dearth of vacant dwellings, the falling-off in new construction, and the increasing population. It admitted that under these conditions it could not maintain all standards as it would and called attention to the increase of families in lodgings. But it did maintain sanitary standards, and in spite of the dearth of dwellings, to which its own report called attention, it vacated five tenement houses because of their insanitary condition. In this it has the moral support of the Federal authorities, for the U. S. Housing Corporation, whose purpose was to secure additional housing for war workers, constantly laid emphasis upon the need of making and keeping dwellings wholesome and habitable. The Federal authorities, however, did not interfere in local housing regulation except in the immediate neighborhood of large camps. There, as at Norfolk, they made their influence felt. The interest of the Ordnance and Navy Departments in the health of workers on war contracts pointed in the same way as did that of the U. S. Housing Corporation, which made housing surveys of 52 cities in its search for available dwellings, and which, despite its desire to secure accommodations, discarded all insanitary houses, residence in which would reduce the productive efficiency of workers. "Every effort," it stated officially, "is being made to protect health and morals and gain comfort."

The Federal Government's Housing Policy.—So for the period of the war there was an increase of Federal initiative and control based upon the need for producing our maximum. Federal participation in housing was a war measure, and even those who were working out the plans for managing the new industrial communities built with Government money would say nothing publicly of what they thought should be done with those communities when the war ended. A brief record of the progress in the Government's own programme was embodied in an article which appeared in the *Journal of the American Institute of Architects* for September. It included a list of Government housing projects under way and proposed at that date.

The U. S. Housing Corporation did not expend Government funds to build war houses except upon the request of that department of the Government which was interested in the products manufactured in the community in question. When a community with war contracts complained of a housing famine but had made no effort itself to remedy the situation, further Government contracts were withheld. The Housing Corporation was not in a position to lend financial assistance to private enterprises. It was, however, deeply interested in and wished to encourage any undertakings calculated to relieve the housing situation for workers in essential industries where the need for such relief was urgent; where the cost to the workmen for such houses, either on a rental or a selling basis, was well within their means; and where the character of the housing proposal measured up to the standards established by the Corporation.

To this end a policy was formulated under which the Corporation, after a careful investigation of the merits of each case, undertook to obtain official approval of a project and thereby secured for it benefits of priority orders, should they be required, clearance and transportation of materials, and such other assistance as it was deemed proper and expedient to render to insure the prompt completion of the work. To secure the approval of the corporation it was necessary for a concern or individual to make independent arrangements for the complete financing of a housing project and agree in carrying out the undertaking to comply with such stipulations as the corporation should impose.

In the Government's own programme what was to have been the greatest housing undertaking in the world was begun on Neville Island near Pittsburgh. It was to have been the home of workers in the ordnance plant to be established there. Neville Island is in the Ohio River near the point where the Monongahela and Allegheny Rivers enter. It is seven miles long and one mile wide, and on the banks of the river on either side of the island runs a railroad, the New York Central on one side and the Pennsylvania on the other. The plant was to have employed from 20,000 to 25,000 men, and the building and equipment to cost about $50,000,000. The housing project meant that a complete city would be built having a population of 50,000. It would have called for construction of 15,000 separate dwellings.

Housing for Women.—The report of the housing committee of the War Council of the Young Women's Christian Association on "Housing for Women in War Work," together with plans for three suggested types of houses and a recreation building, were transmitted in January to the Secretary of War and to Otto M. Eidlitz, as chairman of the Housing Committee of the Council of National Defense. Housing of women is a very special problem and one which has received but little consideration. This contribution to the subject is especially significant, aside from its timeliness in connection with wartime needs. As a demonstration for the benefit of Government authorities and others confronted by this problem just now, the Association erected a permanent structure of the "Type A" plan recommended in its report at Charleston, S. C., for girls working in the naval uniform factory. The "Type A" building, which is designed for use in places where only one building will be erected, includes not only living and dining rooms but also recreational facilities. It will accommodate 110 girls. "Type B" building is for 150 girls—a unit of a group in an industrial community. "Type C" is a four-family house designed for the use of four groups, either of older women who wish to live independently, or of non-English speaking foreign girls. Each apartment contains a combination living room and kitchen and three bedrooms.

The following comments and recommendations upon the housing of women contained in the pamphlet are especially interesting:

1. Younger girls should live in groups where they can have social life and an opportunity to entertain their friends, but still be under some of the restrictions of the home.
2. Older women want independence of living. Many of them object to living in large groups because of the noise and confusion and ensuing fatigue.
3. In every case colored girls and women should live by themselves, and provision should be made for their social life.
4. It has been found that it is more successful to house the non-English speaking foreign girls in small groups until they learn English and become used to American customs. A social worker can be employed to work with them.

In regard to the headship of the houses the committee says: "It is not sufficient to provide a working matron, no matter how excellent her knowledge of housekeeping. There must be a social head of the house, a woman of tact and experience, who can get and hold the respect of the girls."

Committee on New Industrial Towns.—This Committee organized itself informally in 1916 for the purpose of studying the conservation of increments of land values in new cities and preparing a statement to point out to the officers of large American corporations the desirability of forestalling land speculators and of conserving for the benefit of the community the increment of land value which such corporations create when they set up new plants and establish new towns. R. M. Haig of Columbia University has made a study of the history of land values at Gary, Ind., for the Committee, and Herbert S. Swan a study of the situation at Lackawanna, N. Y. The Committee, of which Lawson Purdy is chairman and Richard S. Childs (381 Fourth Ave., New York) is secretary, has published during the year two reports; one entitled "A Memorandum to the Steel Corporation," a plan for the conservation of future increments of land values at Objiway and for conversion of the same into additions revenues for community purposes; another leaflet entitled "A Self-Owning Town" is a report to the vice-president of the Newport News Shipbuilding & Dry Docks Co., which already has a copartnership scheme for Hilton, Va. A third pamphlet deals with a question of "How Shall the Government Dispose of Its Industrial Housing?"

FIRE PREVENTION

Progress in Fire Prevention.—Important developments along fire-prevention lines during the year included the creation by the Federal Government of a fire-prevention section of the War Industries Board with William H. Merrill, former president of the National Fire Protection Association, as chairman. This section had supervision over the fire protection of all plants in the country producing munitions of wars, the term "munitions" applying to practically everything purchased by the Government at the time. Action by the Government placing the regulation of explosives under the U. S. Bureau of Mines, with special commissioners having local jurisdiction in each of the states, was also considered as a salutary fire prevention, as well as a measure designed to protect the nation against internal enemies and loss of life from careless handling of explosives. The continuance of the National Fire Protection Association's active campaign to fix the cost of extinguishing fires upon citizens disobeying fire-prevention orders (*A. Y B.*, 1917, p. 207) crystallized during the year in ordinances to this effect passed by Cincinnati, Ohio, and Portland, Ore. Other cities are discussing this measure. Another development to be noted is the acceptance by various departments of the Government of the factory-inspection label of the Underwriters' Laboratories upon fire hose, roofings, chemical extinguishers, and many other devices and materials used by the Government in fire protection.

Fire and Accident Prevention Day, usually set for Oct. 9 (the anniversary of the great Chicago fire), was postponed to Nov. 2 by request of the Secretary of the Treasury in order that the Liberty Loan campaign might not be interfered with in October. In consequence of this postponement the fire-prevention cause had the united support of the four-minute men during the week ending Nov. 2.

There have been two important fire-prevention congresses during the year, one in Columbus, Ohio, called under the direction of the state Industrial Commission, and another in Canada, convened by the Premier of Ontario, Sir William Hearst, and conducted by the fire marshal's office.

Census of Fire Departments.—Fire prevention by cities and states is discussed in the report published by the U. S. Bureau of the Census on "Statistics of Fire Departments of Cities Having a Population of 30,000" for the year 1917. This report shows that 16 cities have separate bureaus organized for the purpose of conducting fire-prevention work; the majority of the 219 cities report fire-prevention work in some form or other, usually the inspection of certain classes of buildings or hazardous districts by detailed members of the fire department. The work of the bureaus of fire prevention in the cities of New York, Chicago, Cleveland and Pittsburgh is described at length, as well as the work of the Massachusetts fire-prevention district established in 1914 and the fire-prevention work of state fire commissioners or fire marshals. Fire-prevention bureaus are maintained in the following cities: New York, Chicago, Philadelphia, Cleveland, Los Angeles, Milwaukee, Newark, N. J., Washington, Seattle, Kansas City, Mo.; Portland, Ore., Rochester, Columbus, Ohio, Dayton, Bridgeport, and Savannah. Besides fire-prevention work, the report deals with all aspects of fire protection and fire-department organization and equipment.

Educational Propaganda.—The National Board of Fire Underwriters proved that the need for conservation rendered this a favorable time for carrying on an educational propaganda among the people to prevent unnecessary fire losses which annually run into many millions of dollars in the United States (see also XIII, *Property Insurance*). They have shown that a large percentage of fire losses might be prevented by the exercise of simple and easy plans of care and foresight. Their plan was endorsed by the Council of National Defense and the state Councils of Defense were requested to give their endorsement and lend their support to the Board in securing the adoption of their recommendations by manufacturers and other large insurers. Further efforts to prevent fire losses have been made in many cases by state Councils by insisting that better methods of fire fighting be provided by municipalities, by cooperation in the use of apparatus by adjoining or nearby municipalities, and by general publicity and education regarding proper methods of fire prevention. *Municipal Reference Library Notes* for Oct. 23, published by the New York Municipal Reference Library, is devoted to fire prevention and contains lists of books, pamphlets and articles on the subject, as well as programmes for Fire Prevention Day.

Fire-Protection Standards. — The National Fire Protection Association at its meeting in May adopted the report of its committee on fire-resistive construction, which advocates the following measures:

1. The adoption by municipalities of the Standard Building Code of the National Board of Fire Underwriters to the end that fire-resistive building construction may be encouraged, the use of inflammable roof coverings prohibited, adequate exit facilities from buildings assured, and interior so designed and fire-stopped as to make easy the extinguishment of fires therein.
2. The adoption by all states of minimum building requirements for the protection of state and county hospitals, schools, asylums and similar institutions outside city limits and of small communities in which the establishment and enforcement of a building code is impracticable.

3. The enactment by each state of the fire marshal law advocated by the Fire Marshals' Association of North America to the end that official investigation may be made of the causes of all fires, preventable fires may be eliminated by public education, and the crime of arson stamped out.

4. The adoption of the association's suggested ordinance providing for the systematic inspection of all buildings by city fire marshals or local firemen to insure the vigorous enforcement of rules for cleanliness, good housekeeping, and the maintenance of safe and unobstructed exits, fire-fighting apparatus, and other protective devices.

5. The enactment of ordinances similar to that of Cleveland, Ohio, fixing the cost of extinguishing preventable fires upon citizens disregarding fire prevention orders, and a more general legal recognition of the common law principle of personal liability for damage resulting from fires due to carelessness or neglect.

6. The wider general use of the automatic sprinkler as a fire extinguishing agent and life saver, and the more general adoption of the fire division wall as an important life saving exit facility.

7. A careful study of the technical surveys of cities made by the engineers of the Committee on Fire Prevention of the National Board of Fire Underwriters covering the items of water supplies, their adequacy and reliability, fire department efficiency, fire alarm systems and conflagration hazards, and of the possibility of coöperation among neighboring cities through mutual aid, and the standardization of hose couplings.

8. The adoption of the association's suggested laws and ordinances for state and municipal regulation of the transportation, storage and use of inflammable liquids and explosives.

9. The universal adoption and use of the safety match and legislation prohibiting smoking in all parts of factories, industrial and mercantile buildings except in such fire-proof rooms as may be especially approved for the purpose by fire departments.

10. The education of children and the public generally in careful habits regarding the use of fire.

11. The coördination of all these activities through a central administrative officer or body of the state or city having primary jurisdiction, for the purpose of promoting uniformity of action and efficient coöperation.

Fire Waste in Canada.—"Fire Waste in Canada" is the title of a special report resulting from an exhaustive investigation undertaken by the Canadian Conservation Commission. It appears that the average per capita fire loss in Canada and other countries during the years 1912 to 1915 was as follows: Canada, $2.96; Scotland, $1.95; Russia, $0.97; France, $0.74; England, $0.64; Austria, $0.32; Germany, $0.28; Switzerland, $0.13; and Netherlands, $0.11. Fire losses are attributed chiefly to gross and inexcusable carelessness, faulty building construction, arson, and the lack of fire-prevention laws; in other words, to clearly preventable causes. Smoking, for example, caused almost the same percentage of fires as the special hazards of all the numerous industries in Canada. The experience of European countries shows that these losses can be very materially reduced and J. Grove Smith presents a detailed constructive scheme for a fire-prevention programme. In Canada, as in the United States, there must be a coordination of engineering, underwriting, legislative, commercial, and individual interests. Compulsory measures must be adopted which will reduce to a minimum the fire risk in all communities and properties. Town planning should include provisions defining the use of property in given districts, having regard to the development of such districts in relation to the community as a whole. Fire departments should be adequately trained and equipped for fire prevention. Minimum requirements for building construction should be drastically enforced. Regulations for the suppression of dangerous nuisances, such as the storage of rubbish, ashes, etc., should be imposed by every public body. The cause of every fire should be officially investigated and reported upon. Criminal responsibility for fires should be borne by the person who is proven guilty of carelessness or any other cause of fire. The public should be persistently educated through every possible channel as to methods of fire prevention and their individual and personal responsibility.

National Fire Protection Association.—Fire prevention and protection aspects of the war work of the nation were the most important subjects taken up at the principal session of the twenty-second annual convention of the National Fire Protection Association, held in Chicago May 9-11. The Association elected the following officers: President J. F. T. Stewart, New York; secretary-treasurer, Franklin H. Wentworth, Boston.

POLICE

Police Departments and the War.—The effects of the war upon American police departments and police administration were far-reaching. The selective-service law depleted the ranks by taking the younger members into the Army and by reducing the number of available recruits. The departments sought to overcome this condition by raising the maximum age limit for recruits; by simplifying the physical requirements for recruits; by organizing an auxiliary volunteer police reserve or home-defense organization; and by the appointment of more policewomen. Mention should also be made of the work of the police in the registration for military service; in the enforcement of the civil-service law; in the sale of Liberty bonds; in the registration of enemy aliens; in the protection of munitions plants and of Government supplies; and in the many other special duties performed by them in connection with the prosecution of the war. The war also led to the more careful instruction of policemen in marksmanship and in the principles of camp life which would be required by them in case of any serious civil or military disasaster. The increased use of women as police and the expansion of a Home Defense League into a police reserve in New York City were among the other interesting developments. In many of the larger cities, notably New York, Chicago and Philadelphia, it was necessary for the Federal Government to intervene and in some cases practically to control the local police that the soldiers and sailors might be adequately protected.

Police Reports.—The most suggestive police report issued in 1918 was that of the Detroit force under Commissioner James Couzens, later elected mayor. This report is of special interest because it was compiled and published not merely as a matter of annual custom, but with the conscious purpose of making it usable. To help attain this end the superintendent of schools coöperated by having the report used as a supplementary text in civics. The book was attractively arranged, interesting photographs were judiciously used, and in every way the report was made easy to read. In its aims and methods this volume is a recognition of an important function of municipal departments which is usually neglected. It contained, however, considerable extraneous matter which tends to defeat the purpose of an annual departmental statement. The real object of an annual police-department report should be to tell whether crime is on the increase or decrease, what the department did during the period in question, what progress was made as compared with previous periods, what problems confront it, and what the programme is for the subsequent year or years. Like the reports of other police departments, big and little, no relationship is shown between complaints received and their disposition, although the disposition of arrests is recorded. Nor does this report, in common with police department reports generally, contain any information to indicate how the public can do its share in helping to reduce crime and preserve law and order. In the last analysis, if crime is to be reduced, a police department must get the coöperation of the community through a comprehension of its aims. The police force itself is necessarily limited in the preventive work it can do unless every person in the community takes measure to make it more difficult to commit offenses or crimes. To accomplish this it is essential for the department to communicate with the people through reports, annual or quarterly or both, newspaper articles, special feature stories, bulletins, and any other means by which the people of a community can learn the facts about the problems of the department and what the public should do to help solve them. Detailed analyses of the cause of accidents, published not only in reports but spread throughout the city by newspapers and circulars posted in conspicuous places, are attracting considerable attention.

NUISANCES

Smoke.—Notwithstanding the great number of plants that have had to change from gas to coal and those that have had to change from good coal to coal of poor quality, the Pittsburgh bureau of smoke regulation has kept after all offenders against the smoke ordinance and has been instrumental in keeping up the standard of smokeless stacks as closely as the conditions and the weather would permit. The suits in court have been pushed and this action has been rewarded by compelling changes in the methods of firing and the addition of temporary furnace changes resulting in smokeless stacks. The chief of the bureau, J. W. Henderson, contributed a comprehensive paper on the subject of "Fuel Consumption Control by the United States Government" to *Power* of Jan. 22, 1918. In the experience of Pittsburgh and other cities there is every indication that fuel consumers are appreciating the value of smoke regulation in aiding in the reduction of the enormous waste of fuel in smoke, which for 1916 was estimated to amount to more than 100,000,000 tons of coal, leaving the waste of gas and oil as fuel entirely out of the estimate.

Hermann M. Biggs, New York State Commissioner of Health, who was directed by Governor Whitman to make an inquiry as to the smoke and fumes from New Jersey which annoy residents of New York City, finds that "the conditions arising from the emission of smoke, gases, fumes, and vapors constitutes a public nuisance, which affects the comfort and repose, and also indirectly, if not directly, the security of life and health of a considerable number of persons in New York." Attorney-General Woodbury announced that he would immediately commence an action in the U. S. Supreme Court on behalf of the state to restrain the offending factories on the New Jersey shore from contaminating the atmosphere of the upper side of Manhattan. However, an understanding has been reached with the companies responsible whereby certain improvements will be installed which are expected to result in an effective abatement of this nuisance.

That the smoke inspectors in Cincinnati are securing results in their efforts to rid the city of the smoke nuisance is evident in the judgment of Walter M. Squires, the recent superintendent of the Smoke Abatement League, from the fact that within the last four years fully 75 per cent. of the smoke from the factory, power and office buildings has been abated. The manufacturers almost invariably reply that they are willing to do anything that they can, and invite the inspectors to examine their furnaces. The advice of the Smoke Abatement League has been accepted in hundreds of cases and is often solicited. In plants where unusual conditions exist and it seems impossible for the engineers to operate differently, the League has insisted that furnace changes be made to meet the conditions. In such cases a thorough diagnosis of the plant is made and the owner is usually advised to what extent alterations must be made. Where necessary or advisable, the League furnishes drawings showing the work in detail.

The U. S. Fuel Administration made little effort toward the promotion of fuel economy through the suppression of the smoke nuisance in cities. The problem of the Bureau of Conservation has been rather to show consumers how to burn such coals as have been available for local use, without interfering to too great an extent with municipal smoke regulations. In its general campaign for increased efficiency in the use of coal it had the active coöperation of many of the smoke departments of the larger cities, as its interests in this branch of work were almost identical with theirs.

The thirteenth annual convention of the Smoke Prevention Association was held in Newark, N. J., Aug. 20-22. The most important discussions related to fuel conservation. Warren A. Edson was elected president, and Frank A. Chambers, secretary.

Billboards. — A constitutional amendment proposed by the Constitutional Convention in Massachusetts and approved by the electors of the state on Nov. 5 gives the legislature power to regulate and restrict advertising on public ways, in public places, and on private property within public view.

MUNICIPAL ORGANIZATIONS

National Municipal League. — The twenty-fourth annual meeting of the National Municipal League was held in New York, June 6-7, in conjunction with a Conference on War-Time Finance and Economy. The Governmental Research Conference met at the same time and place. One session of the League was devoted to a consideration of the subject, "How Shall We Head off Bolshevism in American Cities?" For the purposes of discussion the committee on programme gave "Bolshevism" a special meeting of its own, namely, "dangerous unrest—a tendency to disregard the established political mechanism in efforts to secure results by unlawful short-cuts." Another session was devoted to the war-time work of civic organizations, and a third to new duties of city and state government in war times. The franchise and county-government committees reported through their respective chairmen. An important report from the survey committee containing 11 recommendations concerning the development and extension of the League's work was adopted. It was based upon a detailed study of the League's records and upon a questionnaire which had been sent to all the members of the committee. The report was an appraisement of the work of the League and of the possibility of extending its usefulness to meet the increased demands which rapidly changing conditions are making upon it. Lawson Purdy, George Burnham, Jr., and Clinton Rogers Woodruff were reëlected as president, treasurer, and secretary, respectively. The new vice-presidents elected were: Governor Davis of Virginia; Senator Morton D. Hull of Chicago; Otto Kirchner, Detroit; W. D. Lighthall, Montreal; Albert Shaw, New York; Mrs. V. G. Simkhovitch, New York.

American Civic Association. — No meeting of the American Civic Association was held during 1918, partly because of war-time conditions and partly because of the prevailing influenza epidemic. In the spring Richard B. Watrous resigned as secretary and Andrew Wright Crawford was elected field secretary of the Association.

The American Society for Municipal Improvements held its twenty-fifth annual meeting in Buffalo, Oct. 2-4. The principal business transacted was a revision of the Society's constitution, under which standing committees will continue to guide the constructive work of the Society.

The Governmental Research Conference held its fourth annual meeting in New York, June 5-7, in conjunction with the meeting of the National Municipal League. So far as tangible results are concerned it was the best meeting thus far held. Among the subjects discussed were municipal accounting and finance, street cleaning, public health, public employment, use of specialists in the war and after. The old officers were reëlected, including Otto Kirchner of Detroit, president, and Leroy E. Snyder of Rochester, secretary.

City Managers Association. — The fifth annual convention was held Nov. 6-8, at Roanoke, Va. Clarence A. Bingham, Waltham, Mass., was elected president, and Harrison Gray Otis was reëlected secretary.

Reconstruction Platform of the National Municipal League.—A national conference to consider American reconstruction problems was held at the call of the National Municipal League at Rochester, N. Y., Nov. 20-22. Among the questions discussed were the new relation of the Federal Government to state and local communities; the replanning of the United States with regard to housing, transportation and city planning; problems of reconstruction with respect to urban transportation; public employment; and the present and future government of war-time communities. There were also a series of addresses by representatives of Great Britain, France, Belgium and Italy, concerning reconstruction work in those countries. The following platform was adopted:

> During the war, as measures of necessary national efficiency, numerous matters formerly within private control passed to the control of the people. Some of these things should undoubtedly be returned promptly to private enterprise, but the American people will miss a great opportunity if they allow certain of these temporary powers to slip through their fingers in the next few months.
>
> 1. During the war the long desired Federal Employment Service has been created and the national Government has assumed responsibility for connecting employers and workers in the only right and efficient way. This service should be encouraged to extend its sphere to include the education of employers in modern principles of employment.
>
> 2. Corporations, particularly those doing an interstate business, have become a great source of Federal revenue and may reasonably be expected to continue to be such. Federal control and supervision of their practices should be continued and extended for they create national, not merely state-wide, problems. Effort should be made to free them from conflicting and ineffectual state regulations by a Federal incorporation procedure.
>
> 3. The Government has assumed control of railroads, telegraphs and telephones, opening the opportunity for either Federal ownership with private operation, or Federal ownership with Federal operation, or a reorganization by economical regional systems under a method of control that will protect private capital by insuring a reasonable return, yet removing speculative and antisocial features of the private ownership of the past with its relatively feeble and negative scheme of regulation. Whichever principle is adopted is a smaller matter than that the essential features of our present control should never be relinquished.
>
> 4. The Federal Government has acquired by its merchant fleet and its War Trade Board intimate knowledge and capacity for mobilizing our resources for foreign trade. Factors which will be valuable in normal peace times shall be retained.
>
> 5. The Federal Government through its Food and Fuel Administrations and its War Industries Board has acquired a command over basic resources which played a vital part in securing national efficiency. Every effort should be made to preserve the nucleus of these valuable agencies in such form and with such powers that we may achieve some part of that efficiency in peace.
>
> 6. The Federal Government has manifested grave interest and exerted its war powers to influence the cost of living and prevent profiteering. It should continue to exert its peace powers toward the same beneficent end.
>
> 7. The Federal Government has concerned itself effectively in the problem of housing industrial workers and has placed upon a new basis of prestige and authority the American movement for garden cities and suburbs. Its interest in this aspect of the welfare of the workers and the efficiency of industry should not now lapse but the Labor Department's Bureau of Industrial Housing should be continued and its powers broadened to include educational work and research into our vast industrial housing problems.
>
> 8. As a measure of protecting the effectiveness of its soldiers and industrial workers, the Federal Government has found it necessary to use its influence with local governments regarding moral and health conditions. Such Federal interest in local governments should not lapse, but should result in the continued attack upon vice problems by the Public Health Service and in the formation of a Federal Bureau of Municipalities in the Department of the Interior to collect and distribute information on municipal problems.
>
> In short, we, as a people during the next few months, must vigorously hold the ground we have gained during the war.

MISCELLANEOUS

Strikes of Municipal Employees.—Strikes and threatened strikes of municipal employees were unusually numerous during the year. The Salt Lake City commission during the summer received a communication signed by a committee representing the members of the fire department requesting an increase of $20 per month in pay and an extra 12 hours off each week. It set forth that they were acting in an organized capacity, the members of the department having been organized into a labor union. When the application was presented it was believed that the firemen were perhaps underpaid but the commission did not feel that they should receive any more consideration because of their union affiliation than the men of other departments who were also compelled to pay higher prices for living expenses. The commission decided that it would revise its budget and raise the wages of all employees as much as it possibly could without increasing the tax levy. It was found that the salaries could be raised about $15 per month. This was decided upon and met with the approval of all the city employees except the firemen, who saw fit to resign in a body. They gave four days' notice of a walk out. The resignations were given in blanket form and were immediately accepted, and the commission was in the act of making arrangements with others to take their places when the men, upon second thought, realized that the commission had done the best it could in the circumstances and receded from their position. The commission allowed them to combine their two hours off each day for dinner and take the 12 hours at one time.

In Dayton a so-called "welfare association" was formed by the patrolmen "(1) to promote stricter discipline in the department, and (2) better to protect the public interest." Shortly after its formation and when about 100 out of the 170 patrolmen, comprising the city's police force, had joined the association, the city manager had occasion to suspend an inspector of police on charges. A committee from the association waited upon him, stating among other things that they would resign in a body if this inspector did not get a "square deal." They also took a stand on several other matters which did not come properly within the jurisdiction of a welfare association. The result was the following official order from the city manager:

> As you know, when the so-called welfare association of the police department was being formed, there was some question raised as to whether such an association would really tend to protect the public interests and promote discipline in the department, as claimed by its organizers. Our experience, to date, unfortunately has not demonstrated the advisability of having such an association in a semi-military organization, such as the police department. Accordingly you will modify immediately the rules of the safety department so as to prohibit membership in any organization such as this has proved itself to be. There is already an association known as the Dayton police benevolent association, which has been in existence for the past thirty or forty years and the above is not intended to prohibit membership in this benevolent association. If there are any members of the welfare association who do not see fit to abide by the rules which you may adopt in connection with the above, and prefer to retain their membership in the association, you will then accept the resignation of each one so disposed.

This was immediately followed by the adoption of rules by the safety department embodying these instructions. The findings of the civil-service board in the case of the deposed inspector sustained the action of the city manager. After a number of conferences on the part of the committee of the association and its attorney with the city manager, his order was carried out, the association was disbanded and their charter from the state revoked.

Altoona's city manager issued an order for the division of time in the fire department between 10 a. m. and 10 p. m. into periods during which some member of the company shall serve on watch and be responsible for receiving telephone calls and alarms. He also provided for the installation of a company journal to be kept by the men on watch. This resulted in dissatisfaction, a captain who had been politically active in the bureau stirring up the men to resist the enforcement of the order. The city manager after a hearing suspended him for insubordination. There was an appeal to the council which sustained the city manager. A committee representing the men served notice that unless the captain was granted pay for the period of his suspension they would leave the service. They also made several other demands in a paper signed by 51 members of the bureau. About 12 left the city's employ, six having obtained more lucrative positions. The majority of those who signed the petition reconsidered their action and several of the men who left applied for reinstatement. The orders in question were issued upon the recommendations made by the National Board of Underwriters for improving the service and after consultation with the chief of the bureau of fire.

Municipal Fuel Yards.—The U. S. Supreme Court in the case of Jones *v.* Portland (Me.) held that a statute authorizing any city or town to establish and maintain a permanent wood, coal and fuel yard for the purpose of selling wood, coal and fuel to its inhabitants at cost does not take the property of taxpayers for private uses in violation of the Fourteenth Amendment, especially where the highest state court of the state has declared the purpose to be a public one.

VI. MUNICIPAL GOVERNMENT

FINANCIAL STATISTICS OF CITIES OF POPULATION ABOVE 50,000

(In Thousands of Dollars)

This table is identical, except for minor corrections, with that published in the YEAR BOOK for 1917 (pp. 215-6). The figures relate to the fiscal year ending June 30, 1917, or to the first fiscal period prior thereto. Owing to unusual lateness of returns to the Bureau of the Census no later figures are available.

	Population, 1910	Assessed Valuation of Property	Total Tax Levy for Municipal Purposes	Total Revenue Receipts	Government Cost Payments			Net Debt
					For Expenses and Interest	For Outlays	Total	
Akron, Ohio	69,067	144,710	1,754	2,716	1,850	899	2,749	7,747
Albany, N. Y	100,253	124,630	2,479	3,352	2,665	1,234	3,899	7,354
Allentown, Pa	51,913	61,534	775	991	696	574	1,270	1,300
Altoona, Pa	52,127	27,240	566	987	716	282	998	1,857
Atlanta, Ga	154,839	183,259	2,307	3,858	3,132	639	3,771	4,563
Atlantic City, N. J	46,150	97,086	1,568	2,561	2,077	691	2,768	7,256
Augusta, Ga	41,040	36,779	551	1,162	987	267	1,254	3,676
Baltimore, Md	558,485	868,426	11,219	18,184	14,531	3,176	17,707	66,926
Bayonne, N. J	55,545	65,507	1,019	1,957	1,859	227	2,086	2,321
Berkeley, Cal	40,434	45,856	878	1,459	1,107	289	1,396	1,665
Binghamton, N. Y	48,443	46,198	1,129	1,295	1,093	538	1,631	2,072
Birmingham, Ala	132,685	103,771	1,037	2,224	1,869	237	2,106	6,782
Boston, Mass	670,585	1,609,321	26,569	38,397	30,545	3,449	33,994	86,271
Bridgeport, Conn	102,054	169,667	3,323	3,113	2,521	1,667	4,188	5,719
Brockton, Mass	56,878	55,816	1,144	1,750	1,398	470	1,868	3,423
Buffalo, N. Y	423,715	590,213	13,243	19,032	14,309	3,475	17,784	34,597
Cambridge, Mass	104,839	132,192	2,808	3,822	3,052	357	3,409	6,644
Camden, N. J	94,538	77,028	999	2,177	1,830	452	2,282	4,513
Canton, Ohio	50,217	93,632	957	1,325	1,011	823	1,834	4,271
Charleston, S. C	58,833	21,436	815	1,130	946	182	1,128	4,114
Chattanooga, Tenn	44,604	36,381	600	943	800	231	1,031	3,672
Chicago, Ill	2,185,283	1,032,876	55,914	87,931	61,132	31,543	92,675	71,696
Cincinnati, Ohio	363,591	610,499	9,232	14,863	13,190	3,648	16,838	64,412
Cleveland, Ohio	560,663	969,767	14,690	22,367	16,645	8,189	24,834	67,821
Columbus, Ohio	181,511	295,818	3,869	5,289	4,359	1,606	5,965	10,163
Covington, Ky	53,270	32,427	567	960	857	332	1,189	2,595
Dallas, Tex	92,104	120,523	2,289	3,726	2,540	1,410	3,950	5,744
Dayton, Ohio	116,577	178,831	2,051	2,913	2,270	1,332	3,602	7,547
Denver, Colo	213,381	306,660	4,578	7,206	5,271	566	5,837	573
Des Moines, Ia	86,368	37,689	2,111	2,230	2,007	850	2,857	4,457
Detroit, Mich	465,766	1,176,517	17,490	23,593	13,892	12,722	26,614	21,993
Duluth, Minn	78,466	80,546	1,751	3,219	2,068	1,271	3,339	6,831
East St. Louis, Ill	58,547	12,577	716	1,096	867	395	1,262	1,680
Elizabeth, N. J	73,409	72,521	988	1,699	1,304	421	1,725	2,878
El Paso, Tex	39,279	50,012	940	1,710	1,198	962	2,160	3,149
Erie, Pa	66,525	53,113	918	1,616	1,082	521	1,603	1,833
Evansville, Ind	69,647	44,856	896	1,699	1,022	668	1,690	1,883
Fall River, Mass	119,295	113,516	2,162	3,105	2,321	974	3,295	5,489
Flint, Mich	38,550	47,594	831	1,446	829	956	1,785	2,472
Fort Wayne, Ind	63,933	41,115	868	1,928	1,078	678	1,756	999
Fort Worth, Tex	73,312	67,857	1,255	1,867	1,303	618	1,921	5,622
Grand Rapids, Mich	112,571	163,726	2,004	3,226	2,463	786	3,249	3,989
Harrisburg, Pa	64,186	52,521	1,008	1,389	1,063	271	1,334	2,753
Hartford, Conn	98,915	193,527	3,064	4,204	3,152	1,120	4,272	9,766
Hoboken, N. J	70,324	76,342	1,086	1,875	1,753	933	2,686	3,535
Holyoke, Mass	57,730	66,459	1,088	2,232	1,878	352	2,230	3,252
Houston, Tex	78,800	131,145	2,360	3,099	2,565	2,616	5,181	13,238
Indianapolis, Ind	233,650	249,278	4,573	7,125	4,536	2,925	7,461	6,469
Jacksonville, Fla	57,699	59,560	759	2,114	1,569	983	2,552	4,312
Jersey City, N. J	267,779	323,882	5,369	8,860	7,693	698	8,391	26,267
Johnstown, Pa	55,482	52,817	775	929	712	358	1,070	1,282
Kansas City, Kan	82,331	93,607	1,373	2,201	1,948	784	2,732	5,992
Kansas City, Mo	248,381	210,020	6,582	12,392	7,880	4,344	12,224	12,281
Lancaster, Pa	47,227	29,414	456	719	564	242	806	1,610
Lawrence, Mass	85,892	83,087	1,353	2,064	1,697	492	2,189	3,714
Little Rock, Ark	45,941	34,679	428	765	668	261	929	1,135
Los Angeles, Cal	319,198	480,745	14,058	23,395	18,119	10,074	28,193	49,780
Louisville, Ky	223,928	214,493	3,968	6,158	4,347	1,498	5,845	12,521
Lowell, Mass	106,294	94,503	1,809	2,502	2,043	689	2,732	2,940
Lynn, Mass	89,336	95,087	1,763	2,568	2,085	620	2,705	4,261
Malden, Mass	44,404	43,846	843	1,233	1,014	194	1,208	1,338
Manchester, N. H	70,063	88,831	1,127	1,484	1,293	341	1,634	1,416

FINANCIAL STATISTICS OF CITIES OF POPULATION ABOVE 50,000—*Continued*

(In Thousands of Dollars)

	Population, 1910	Assessed Valuation of Property	Total Tax Levy for Municipal Purposes	Total Revenue Receipts	Government Cost Payments			Net Debt
					For Expenses and Interest	For Outlays	Total	
Memphis, Tenn.	131,105	118,696	1,875	3,253	2,893	351	3,344	11,923
Milwaukee, Wis.	373,857	552,090	10,395	14,017	9,910	4,986	14,796	18,270
Minneapolis, Minn.	301,408	265,152	7,736	11,155	8,910	4,147	13,057	18,878
Mobile, Ala.	51,521	33,407	367	936	769	27	796	2,991
Nashville, Tenn.	110,364	88,761	1,331	2,584	1,983	819	2,802	7,423
Newark, N. J.	347,469	438,423	9,434	15,586	12,638	3,951	16,589	39,191
New Bedford, Mass.	96,652	113,123	2,343	3,431	2,518	955	3,473	8,171
New Britain, Conn.	43,916	46,926	740	1,244	907	258	1,165	3,291
New Haven, Conn.	133,605	173,006	3,227	3,307	2,752	449	3,201	4,499
New Orleans, La.	339,075	244,078	5,419	8,670	7,855	2,922	10,777	41,732
New York, N. Y.	4,766,883	9,313,637	166,255	236,278	196,714	35,982	232,696	987,347
Norfolk, Va.	67,452	96,731	1,546	2,344	1,977	796	2,773	8,897
Oakland, Cal.	150,174	144,839	3,538	5,898	4,269	1,247	5,516	9,281
Oklahoma City, Okla.	64,205	65,110	1,474	1,690	1,261	753	2,014	6,069
Omaha, Neb.	124,096	47,564	3,212	5,705	4,128	1,076	5,204	18,231
Passaic, N. J.	54,773	51,416	671	1,096	957	313	1,270	2,974
Paterson, N. J.	125,600	114,582	1,635	2,600	2,226	616	2,842	5,342
Pawtucket, R. I.	51,622	60,660	927	1,469	1,271	161	1,432	5,347
Peoria, Ill.	66,950	24,242	1,161	1,761	1,251	805	2,056	1,124
Philadelphia, Pa.	1,549,008	2,397,619	32,835	46,668	41,314	18,031	59,345	121,316
Pittsburgh, Pa.	533,905	792,942	16,683	23,638	17,842	5,505	23,347	56,500
Portland, Me.	58,571	73,864	1,207	1,913	1,662	418	2,080	6,948
Portland, Ore.	207,214	303,006	5,029	9,087	6,244	1,988	8,232	16,236
Providence, R. I.	224,326	363,087	4,829	6,995	5,567	1,782	7,349	15,027
Pueblo, Colo.	44,395	30,824	759	1,025	841	357	1,198	2,637
Reading, Pa.	96,071	62,752	1,061	1,475	1,229	243	1,472	2,224
Richmond, Va.	127,628	189,816	2,587	4,307	3,504	1,564	5,068	13,037
Rochester, N. Y.	218,149	249,043	5,235	8,162	6,460	2,600	9,060	13,245
Rockford, Ill.	45,401	22,361	1,025	1,234	875	549	1,424	637
Sacramento, Cal.	44,696	69,145	1,187	2,290	1,597	2,183	3,780	5,247
Saginaw, Mich.	50,510	47,325	840	1,292	899	146	1,045	800
Salt Lake City, Utah.	92,777	172,822	1,845	4,015	2,450	1,631	4,081	6,973
San Antonio, Tex.	96,614	109,172	2,267	2,618	2,048	926	2,974	5,811
San Diego, Cal.	39,578	83,005	2,014	3,014	2,346	682	3,028	10,481
San Francisco, Cal.	416,912	542,563	12,641	20,116	14,760	7,071	21,831	43,407
Savannah, Ga.	65,064	60,226	1,003	1,635	1,256	476	1,732	3,694
Schenectady, N. Y.	72,826	66,503	1,841	2,464	1,785	251	2,036	4,506
Scranton, Pa.	129,867	84,612	1,649	2,138	1,834	259	2,093	2,875
Seattle, Wash.	237,194	212,868	8,464	15,436	10,828	5,662	16,490	34,008
Sioux City, Ia.	47,828	17,119	1,202	1,809	999	801	1,800	1,566
Somerville, Mass.	77,236	79,445	1,540	2,044	1,687	332	2,019	1,729
South, Bend, Ind.	53,684	34,024	850	1,278	863	320	1,183	1,186
Spokane, Wash.	104,402	80,217	1,735	3,733	2,643	367	3,010	8,384
Springfield, Ill.	51,678	15,629	960	1,436	952	420	1,372	1,303
Springfield, Mass.	88,926	201,923	3,213	4,456	3,347	916	4,263	7,893
Springfield, Ohio.	46,921	62,394	680	1,049	801	394	1,195	2,438
St. Joseph, Mo.	77,403	43,446	1,063	1,641	1,100	638	1,738	2,532
St. Louis, Mo.	687,029	733,459	14,782	26,126	17,501	6,768	24,269	19,064
St. Paul, Minn.	214,744	171,870	3,842	6,484	4,878	2,216	7,094	10,487
Syracuse, N. Y.	137,249	163,440	2,965	4,348	3,387	1,206	4,593	9,957
Tacoma, Wash.	83,743	54,629	1,283	3,396	2,323	332	2,655	9,357
Tampa, Fla.	37,782	31,006	723	1,492	914	377	1,291	3,287
Terre Haute, Ind.	58,157	37,677	837	1,077	900	178	1,078	1,280
Toledo, Ohio.	168,497	289,456	3,533	4,511	3,718	2,073	5,791	12,415
Trenton, N. J.	96,815	91,729	1,421	2,690	2,220	554	2,774	2,962
Troy, N. Y.	76,813	66,047	1,450	2,067	1,649	101	1,750	4,836
Utica, N. Y.	74,419	65,161	1,489	1,801	1,423	521	1,944	2,794
Washington, D. C.	331,069	440,415	6,606	16,001	10,180	3,129	13,309	4,717
Waterbury, Conn.	73,141	91,591	1,558	1,964	1,562	478	2,040	5,147
Wichita, Kan.	52,450	65,807	967	1,462	815	196	1,011	1,855
Wilkes-Barre, Pa.	67,105	69,420	1,014	1,279	971	285	1,256	2,455
Wilmington, Del.	87,411	85,648	1,139	1,738	1,442	709	2,151	6,429
Worcester, Mass.	145,986	189,271	3,405	5,413	4,130	1,050	5,180	7,662
Yonkers, N. Y.	79,803	135,601	2,995	3,299	3,174	906	4,080	9,262
York, Pa.	44,750	26,651	427	609	459	223	682	1,125
Youngstown, Ohio.	79,066	185,392	1,900	2,737	1,819	969	2,788	5,294

VII. TERRITORIES AND DEPENDENCIES

Frank McIntyre

ALASKA

Economic Conditions. — Thomas Riggs, Jr., was appointed Governor of Alaska on April 12, 1918, succeeding John F. A. Strong at the expiration of his term of office. He reports that while the industry of the territory during the fiscal year ending June 30, 1918, showed great progress along certain lines, notably in the production of fish, Alaska has suffered intensely from the war. The greatest loss has been in man power, and as a result the normal industry of the country has been paralyzed; mines, fisheries, railroad construction, shops and ships are all working with insufficient forces. It is estimated that about 10,000 persons have left for scenes of greater activity and excitement, leaving scarcely 18,000 white people.

Gold mining has been the hardest hit of all Alaskan enterprises, due to restriction of operations because of the high cost of living and the scarcity of labor, and the production was the smallest since 1904 (see also XVII, *Gold and Silver*). In the fiscal year 1918 Alaska produced minerals valued at $40,700,195, about seven million dollars less than in 1916 but greater than the value produced in any other year. The most valuable mineral product was copper, the output of which was less than for the preceding year, due largely to scarcity of labor.

New development is not expected until immigration takes place, which is looked for when the armies of the world are disbanded. The Governor believes that as population then increases and new markets are found, farming will become one of the greatest assets, and that Alaska can be made absolutely self-supporting in the matter of food. A Siberian wheat has been developed, and it is thought that in 1920 every pound of flour used in the interior of Alaska may be from locally ground wheat. Owing to difficulties of transportation, the Governor recommends that the United States take over, until such time as conditions shall have readjusted themselves to the pre-war status, all steamer or railroad lines to and in the territory. He believes that by the establishment of schedules the fresh-fish industry will be greatly fostered, and by the allotment of cargo space it will be possible to afford a comparatively large Alaskan market for Alaskan coal. The reindeer of Alaska represent an immense food supply, not only for the territory, but for the entire country. Statistics show that this industry has been a great financial success. The five-year period provided by Act of Congress of Aug. 24, 1912, during which the killing of fur seals at Pribilof Islands was prohibited, expired on Aug. 24, 1917. In the calendar year 1917 there were taken on these Islands a total of 8,170 skins, 6,739 of which were sold (see also XVI, *Fisheries*).

Railroads and Roads.—Good progress has been made on the Government railroad. The gap between Seward and Anchorage has been closed. On the main line toward Fairbanks the track has been extended to Montana Creek; on the branch line leading from Matanuska Junction to the coal fields the track has been extended 37.7 miles to Chickaloon in the heart of the coal fields. Considerable development work has been done in the Matanuska coal fields. Agricultural development is progressing favorably in the Matanuska Valley and at other points along the railroad line.

During the fiscal year ending June 30, 1918, the Alaska Road Commission expended $597,020.18. The total mileage constructed by the Commission was, on June 30, 1,006 miles of wagon roads, 673 miles of sled roads, and 2,346 miles of trail. The crying need of the territory is for roads, and the Governor estimates that an additional appropriation of $750,000 or $1,000,000 would only be a fair amount for the Alaska Road Commission to continue its work.

Education.—The citizenship night schools established in 1917 (*A. Y. B.*, 1917, p. 219) have proved a success. The 40 white schools outside of incorporated towns employed 58 teachers and had an enrollment of 1,180 for the school year 1917-18. The 15 white schools in incorporated towns employed 77 teachers and showed an increase in the number of pupils from 1,778 to 1,847. The building for the Alaska Agricultural College and School of Mines at Fairbanks, appropriated for in 1917, is well under way, but the college will not be in operation before 1919.

Health.—Health conditions among the natives continue to improve, though the present appropriation to meet their medical needs is wholly inadequate. During the year the Bureau of Education has enlarged and equipped a 11-bed hospital at Kanakanak, has operated a 20-bed hospital for natives at Juneau, and erected and placed in operation one at Akiak. Plans are being made to open a tuberculosis sanitarium at Haines.

Commerce and Industries. — There is a steadily increasing trade between Alaska and northern Siberia. The total commerce of Alaska with the United States for the fiscal year 1918 was $131,767,788, as compared with $121,265,947 for 1917. There was a notable increase in the export value of sea products, while the value of copper, gypsum, stone, marble, gold and silver decreased. As in previous years, the salmon industry remained the predominant factor in the fisheries of the territory, halibut ranking second (see also XVI, *Fisheries*). On imports from the United States increases are shown in coal, lumber, hardware and machinery, and provisions.

The following table gives the shipments from Alaska to the United States for the last three fiscal years ending June 30 (see also XIX, *External Commerce*):

	1916	1917	1918
Copper...	$26,488,288	$33,098,190	$20,217,635
Fish.....	19,629,431	23,833,662	46,059,072
Gold.....	16,195,635	15,409,529	12,416,660
All other.	3,607,720	3,887,177	6,030,462

GUAM

General Conditions.—Capt. Roy C. Smith, U. S. N., who continues as Governor of Guam and commandant of the Naval Station, reports progress in the island of Guam. The deposits of the Bank of Guam increased during the fiscal year 1918 from $76,884.97 to $110,423.25. Universal military training has become established; the active militia now numbers 973, about seven per cent. of the native population. The native population is 14,124, an increase of 427 over the preceding year. The population other than native consists of 220 permanent residents, 104 of whom are Japanese, and 625 at the Naval Station. The 28 New Guinea men prisoners of war (*A. Y. B.*, 1917, p. 221) remain in Guam, but steps are being taken toward their return to New Guinea when transportation can be secured. The Guam Congress has continued to hold its regular monthly sessions, and various of its recommendations have been adopted. The Governor recommends that legislation for Guam should include the question of citizenship, revision of the old Spanish code, and a homestead law.

Agricultural and Economic Conditions.—The island subsists in the main on the proceeds of copra and the money spent by the Federal Government. Agriculture makes up the difference. The area of the island is 210 sq. miles, probably about 100 sq. miles being good for crops or pasture land. There are enough natives to cultivate all the fertile land, but they do not do it for several reasons: they are poor and have no suitable farm implements; there are not enough roads to market the produce; crops can not be stored as there are no granaries; a great many people are engaged in the preparation of copra, which is not a food; too many people live in towns. Efforts are being made to remedy these conditions, and among the recommendations of the Governor are the following:

- Congress to continue the annual appropriation for roads.
- Congress to establish rural credits for benefiting agriculture, building granaries and storehouses, and establishing stock and agricultural farms, this to offset typhoons and the discontinuance of the transport service and make the island self-sustaining.

The second annual Guam Industrial Fair took place on July 4-6, 1918. A typhoon passed over the island on July 6, 1918, causing great damage to the coconut trees. It is planned to double the present road mileage (78), and with $40,000 available for roads and bridges, the outlook is encouraging. Effort is being made to promote the planting and growth of coffee, which is of very high quality. The passage of an act of the Philippine Legislature "to provide for the free entry in the Philippine Islands of the products of Guam," approved by the President on May 6, 1918, removed the main obstacle to trade.

Education.—The following statistics show some improvement in the school situation:

Number of pupils enrolled.......	2,501
Average daily attendance........	1,702
Total teachers and substitutes...	43
Number of schools..............	13

Most attention is given to teaching English, in which the progress is still far from satisfactory. The children speak Chamorro at home and it will be a long time before English is spoken generally throughout the island. Several vocational courses have been established, and the children have taken to them with avidity. The amount expended for educational purposes was $14,405.32. At the age of 16 the school boys pass into the Guam Militia.

Sanitation.—General sanitary conditions have perceptibly improved. The greatest menace to health continues to be intestinal parasites. Dr. John B. Grant, of the International Health Board of the Rockefeller Foundation, visited the island in May and examined local conditions, and his visit served to assure the island authorities that they were on the right track in contending with this scourge. Four lepers were transferred to Culion, P. I., in May, and, so far as known, there are no lepers in Guam at present. There are 369 cases of gangosa under observation and several cases of yaws.

Commerce and Industries.—Imports for the fiscal year 1918 amounted to $358,146.91, an increase of $71,494.96 over the figures of 1917. Those from the United States increased $94,063.14, while there was a decrease of $58,820.69 from Honolulu. The exports amounted to $131,757.91, an increase of $45,227.96 over the preceding year. The increase in trade with Japan (exports and imports) is noticeable, amounting to $44,101.72.

HAWAII

General Conditions.—C. J. McCarthy was appointed Governor of Hawaii on May 4, 1918, succeeding Lucius E. Pinkham at the expiration of his term of office. The assessable property of the territory on Jan. 1, 1918, was $235,650,967. Twenty-three banks were in operation during the year. Bank deposits increased $1,820,691.87. The First and Second Regiments, Hawaiian Infantry, National Guard, were drafted into Federal service on June 1, 1918. On June 30 the strength of the National Guard of Hawaii was: officers, 26; enlisted men, 329. The estimated population on June 30, including that of the Army and Navy, was 256,180. One of the largest waterfront terminal projects in the Pacific, the construction of piers 8, 9 and 10 at Honolulu, was completed during the year. The new territorial prison was also completed.

Legislation.—Owing to a severe storm, the greatest in the history of the territory, a special session of the legislature was called to provide appropriations to rebuild bridges. The session opened on May 14 and completed its labors on May 31.

Congress passed an act granting to the legislature of Hawaii power to submit to the voters the question of woman suffrage; also an act providing for prohibition in Hawaii during the period of the war, with the proviso that at any general election held within two years after the conclusion of peace the repeal of the act might, upon petition of not less than 20 per cent. of the qualified electors at the last preceding general election, be submitted to a vote.

Education and Sanitation. — The number of pupils enrolled in the public schools was 34,343, an increase of 6.4 per cent. No increase is noted in the number of schools, which is 168. Nine hundred and sixty-seven teachers are employed.

Although statistics show an increase of 512 in the number of deaths, the health of the territory may be considered to have been good when compared with communities of similar size on the mainland. The annual death rate per thousand was 15.65. Of the 4,010 deaths during the year, 1,041 occurred in hospitals and other institutions. The three principal causes of death were diarrhea, tuberculosis and broncho-pneumonia. The number of lepers on June 30 was 608. Four cases of human plague were reported during the year.

Agricultural and Economic Conditions.—The total area of public lands is 1,641,873.64 acres, of which 48,849.40 are agricultural lands. During the fiscal year ending June 30, 1918, increase was noted in the exportation of the three principal crops, sugar, pineapples and coffee. While sugar exportations increased in value, there was a decrease in quantity of 40,000 tons. Part of this may be accounted for by the shortage of labor, due to filling up the Hawaii National Guard and the draft quotas, and to the impossibility of securing more laborers from the Philippine Islands, where there is also a labor shortage. To improve the sugar situation the President on June 24 issued a proclamation giving authority to the Land Commissioner and the Governor of Hawaii to lease for sugar cultivation public lands the leases of which had expired or were about to expire and which under the law could not be cultivated within six or nine months thereafter. The Governor reports that one contract made under this proclamation will mean the production of about 10,000 tons of sugar which would otherwise have been lost and that similar contracts were pending.

The total value of domestic exports was $80,487,542, as against $74,992,805 for the previous year. The following table shows the value of the principal local products shipped from the islands during the last three fiscal years (see also XIX, *External Commerce*):

	1916	1917	1918
Sugar	$54,409,587	$62,743,272	$64,109,967
Coffee	418,605	391,568	466,689
Fruits and nuts (mostly pineapples)	6,889,705	8,355,395	8,640,838

PHILIPPINE ISLANDS

Political Conditions. — The world conflict has demonstrated as years of discussion would not the precise feeling of the Filipinos toward the United States. This feeling is shown to be one of confidence, loyalty and gratitude, without servility. Their offer of military assistance was accepted and legal authority for calling into the service of the United States the Philippine National Guard was granted by Congress in January, 1918. The Philippine division was federalized in December, 1918.

The act of the Philippine Legislature offering to construct for the United States a destroyer and a submarine (*A. Y. B.*, 1917, p. 222) was enacted into law on May 29. It has been found more practicable to construct these vessels in the United States. The destroyer, which will be named after the Philippine patriot, José Rizal, is under construction at San Francisco and will be completed about Feb. 1, 1919.

The newly constituted Philippine legislature passed 59 laws during its second session. Among the most important were acts establishing a mint, "to guarantee an interest or profit to any capital invested in the establishment of a pulp and paper factory in the Philippine Islands", providing for the creation and promotion of a national merchant marine, reforming the coinage and currency system, and providing free trade between the Philippines and Guam.

Fred C. Fisher, Associate Justice of the Supreme Court, resigned Nov. 15. He was succeeded by Judge Percy M. Moir of the Court of First Instance.

Economic Conditions.—The Government finances are in a more satisfactory condition than at any period in the history of the Philippine Islands. The currency in circulation, which at the beginning of 1916 was only $25,642,453, had reached the sum of $51,290,156 by the end of 1917 and is increasing rapidly. This increase has brought a new confidence and an activity in investments throughout the islands, and many new industrial and agricultural enterprises have been started. The Philippine National Bank has had no small share in this prosperity, and credit is now available for substantial enterprises for the immediate development of the islands.

The first year of Government control and operation of the Manila Railroad was completed with very gratifying results, showing a profit of $408,319.69 as compared with heavy losses during the preceding two years. Upon the completion of his first year of service, Eugene E. Reed resigned as president of the railroad. He was succeeded by Manuel L. Quezon, president of the Philippine Senate. E. J. Westerhouse, formerly Director of Public Works, was appointed general manager.

The National Coal Co. was organized in March, 1918, in the hope of developing valuable coal deposits in the islands. The Governor-General is of the opinion that the success of the National Coal Co. will prove a factor in the economic development of the islands scarcely second in importance to the Philippine National Bank or the Government operation of the Manila Railroad.

Education.—The efficient system of education established in the Philippine Islands showed steady progress during 1917, the development of agricultural teaching being especially noticeable. The public schools played an important part in the food campaign. The area and production of home and school gardens was doubled during the year. Development continued in all lines of industrial work. The General Sales Department (*A. Y. B.*, 1917, p. 223) organized 254 household centers and thus stimulated the manufacture of handicraft products. Its work was considerably handicapped by the high ocean freight rates, it being difficult to dispose of the more bulky articles, such as baskets and mats. The embroidery industry has had a remarkable growth since the beginning of the war.

A new feature in the physical education programme was the introduction of military training in secondary schools. The knowledge of English is rapidly spreading. The system of education in the Philippines continues to attract the attention of colonial Governments in the Far East, and several commissions visit the islands each year for the purpose of studying the system.

There is a constantly growing interest in education in all sections of the islands, and in spite of the tremendous efforts made to build school houses and open new schools, it is still true that only one-half of the children of the islands are in public schools. Almost all of the school houses are crowded, and continued efforts will be made to secure increased appropriations from the legislature for an expansion of educational work.

During the year 1917 there were completed 112 new school buildings, bringing the total up to 4,702. At the close of the school year ending March 31, 1917, the total enrollment was 675,998; the number of teachers employed was 12,303, of whom 11,826 were Filipinos and 477 were Americans. This latter number had been reduced to 417 on Dec. 31, 1917. Due to the draft, more attractive salaries available in other lines, and other causes, it is practically impossible to obtain a large number of teachers from the United States. This continuing decrease in the number of American teachers materially weakens the efficiency of secondary instruction.

Sanitation.—During the calendar year 1917 there were no serious epidemics in the islands, though cholera was present in the provinces to about the same extent as in the preceding year. Only eight of the 7,959 deaths from cholera occurred in Manila. The most serious feature of the health situation now is the spread of tuberculosis. The death rate from this disease is 2.64 per thousand, and special attention is being given to its control. With 253 deaths from smallpox it became apparent that another general vaccination against this disease was necessary, and 81,390 vaccinations were made during the year. Sanitation work in the provinces has made rapid progress. Relief was brought to 127,000 additional persons by the opening of 56 new dispensaries. One new hospital was opened in Albay, and at San Lazaro a new tuberculosis hospital and a home for the aged and infirm were constructed. Satisfactory progress was made in the extension of water systems and the proper means of sewage disposal. One hundred and twenty-nine artesian wells were drilled. The quarantine service has been particularly successful during the year in protecting the islands.

Commerce and Industries. — The changing commercial relations of the Philippine Islands with foreign countries is still marked, due to the effects of the war. No trade is recorded with the central countries of Europe. Trade with the United Kingdom, France and Spain has greatly decreased, while that with Japan has increased approximately 62 per cent., with Australia has almost doubled, and with China has increased substantially. Trade with the United States, which received approximately two-thirds of all exports and furnished almost three-fifths of all imports, amounted to an increase of 72 per cent. over the previous year and more than doubled that of 1915. The total foreign trade for 1917 was larger than in any calendar year in the history of the islands and was approximately 40 per cent. greater than the preceding year.

The value of imports for 1917 is the greatest on record, being 50 per cent. over that of the preceding year. Higher prices play a considerable part in this remarkable increase. Importations of rice show a considerable decline, while other foodstuffs show a general increase. The large increase in the value of exports is due to higher prices and increased quantities. Hemp again leads on the export list, with copra and coconut products second, and sugar third. The value of hemp exported was nearly as much as that exported during 1915 and 1916, while exports of coconut oil trebled in quantity those of 1916. Sugar exports declined, which is principally accounted for by lack of transportation. The value of cigars and cigarettes exported was the highest on record. Embroideries exported show an increase of over 68 per cent. as compared with the values of 1916. (See also XIX, *External Commerce.*)

The year 1917 closed with a trade balance of nearly $30,000,000 in favor of the islands, as against $24,000,000 for the preceding year, as shown in the following table:

Twelve Months ending December	Imports		Exports	
	From the United States	From other Countries	To the United States	To other Countries
1914	$24,020,395	$24,568,258	$24,427,710	$24,261,924
1915	26,381,069	22,931,114	23,653,211	30,159,793
1916	22,862,673	22,633,665	35,648,133	34,289,050
1917	37,620,648	28,176,383	63,234,358	32,369,948

PORTO RICO

Economic and Political Conditions. —The fiscal year 1918, being the first that has elapsed since the entry of the United States into the war and also the first complete year of operation under the new organic act (*A. Y. B.*, 1917, p. 242) has probably been the most eventful and important in the history of the island. It has been crowded with many forms of war work and with many political activities, and the people have responded loyally and cheerfully to the calls upon their patriotic and political impulses. During the year a cantonment was built at San Juan, where the first quota of some 12,000 men underwent training. The total number of registrants up to July 5, 1918, was 121,241. The drain of men for military service has, as elsewhere, seriously affected all departments of public service.

The economic prosperity has continued upon nearly the same level as the previous year, although there was some loss due to drought and to lack of transportation to the United States. Thirty-two (12 more than the previous year) new domestic corporations with a paid-up capital of $116,600 were organized and authorized to transact business, and seven foreign corporations with a paid-up capital of $27,498,000 were registered and authorized to do business. Two new banks were organized. The aggregate deposits in the 13 recognized banking institutions show an increase of nearly one million dollars over the figures of the previous year, which were the highest of record.

A large amount of road construction was undertaken, the total expenditures for the maintenance, repair and construction of roads and bridges amounting to $1,040,913. Of the 1,189.3 kilometres of completed macadamized Government roads, 10.7 kilometres were built during the year.

In his report the Governor repeats his recommendation for the extension of the rural-credits law to Porto Rico, and for the immediate dredging of San Juan harbor, for which an appropriation has already been made by Congress.

The first election under the new organic act took place on July 16, 1917. Not only was a new legislature chosen, but the prohibition amendment of the organic act was submitted to a vote of the people and was ratified by a large majority. This was put into effect on March 2, 1918, and involved radical increase in local taxation to support the Government in substitution of the taxes lost through prohibition. The first session of the new legislature met on Aug. 13, 1917, and adjourned on Nov. 26; a special session was convened on Feb. 6, 1918, and adjourned on Feb. 16. One hundred and forty-four laws were enacted at these two sessions, including one creating a Board of Agriculture and a forestry act.

Severe earthquakes shook the west coast of the island on Oct. 11 and 24, 1918, which resulted in the loss of probably 100 lives, the injury of about 300 persons, and property losses of about two million dollars, principally in the cities of Mayaguez and Aguadilla.

Education.—The Department of Education felt with special severity the loss of its men for military service, and its work has been greatly handicapped. The work of the schools has been characterized particularly by war activities, and in this respect has accomplished much. Because of its relation to the food-production campaign, this Department laid special stress upon increasing the food supply, and many hundreds of school gardens were established, as well as 26,693 home gardens.

The total enrollment in the public schools was 142,486, being 33.1 per cent. of the estimated total population of school age in the island. In addition, 7,248 attended private schools, and a considerable number were sent to schools in the United States; 2,715 teachers were employed, 909 of whom were men and 1,806 were women. Of the teachers, 174 were from the continent and 2,541 were natives of the island. During the year 32 new school sites were acquired, 26 school buildings were completed, and 13 more are in the course of construction. The schools were conducted in 1,712 school buildings, 540 of which are public property and 1,172 are rented. The total expenditures for education purposes were $2,325,802.43. The Governor, in his annual report for the year 1918, summarizes the school situation as follows:

> While the Department of Education is bravely struggling with its enormous task, nevertheless it becomes increasingly evident as the years go by that the resources of the people of Porto Rico are insufficient to cope with this immense problem of providing educational opportunities for the hundreds of thousands of children that are now in the island. Outside aid from some source will have to be secured before the school work can be organized upon such a scale as will be necessary to overcome within a reasonable period the enormous mass of illiteracy that has accumulated from

> the long past. The local government is doing its best with its available funds, but the job is too heavy.

He recommends an appropriation by Congress to assist in educating the illiterate masses of Porto Rico.

Sanitation.—The New Department of Health (*A. Y. B.*, 1917, p. 225) directed special attention to the study and control of transmissible diseases, which was regarded as of extreme importance because of the encampment of soldiers in the island and also because of the alarming increase in the death rate for the previous year. As a result, a slight falling off was reported in the death rate—from 28.5 per cent. per thousand in 1917 to 27.7. More than 62 per cent. of this high mortality was due to infant mortality, tuberculosis, malaria and hookworm. Close attention is being given to the milk supply to check infant mortality. The erection of an anti-tuberculosis hospital is being pushed rapidly, and hospitals and stations for the treatment of malaria and hookworm are also rapidly approaching completion. The location of a military camp also directed attention to the unsanitary conditions existing in the congested districts of San Juan, and work has been begun to clean up these districts. There were no serious epidemics during the fiscal year 1918, except of measles, but in November, 1918, there was a serious outbreak of Spanish influenza.

Commerce and Industries. — The external trade in the fiscal year ending June 30, 1918, reached a total of $137,683,304, which is $3,167,163 in excess of the previous high record in 1917. There was a decrease in exports of over six million dollars, due to lack of transportation of sugar to the United States. In the exportation of articles other than sugar, there was a notable increase of nearly $7,000,000, practically all of the increase being in the items of cigars, cigarettes and tobacco. Imports increased nearly ten million dollars, reaching the unprecedented figure of $63,389,782, due chiefly to the higher price of the articles imported. (See also XIX, *External Commerce.*)

The total exports for the last three fiscal years are shown in the following table:

	1916	1917	1918
Sugar....	$45,809,445	$54,015,903	$41,362,229
Coffee....	5,049,283	5,892,081	5,505,316
Tobacco..	8,587,852	11,723,712	16,142,555
Fruits....	3,355,285	3,459,569	3,628,214
All other.	3,929,708	5,879,652	7,655,708
Total..	$66,731,573	$80,970,917	$74,294,022

AMERICAN SAMOA

Governor J. M. Poyer reports that the year 1917 was one of prosperity in American Samoa. There is no indebtedness, and the cash in the island treasury is the greatest in the history of the Government. Health conditions were excellent. The Samoan Hospital Training School for Nurses has continued to train native girls, four having graduated during the year.

There has been no change in the school system. The new government school on Pago Pago Bay (*A. Y. B.*, 1917, p. 226) was completed and the building was dedicated on Jan. 23, 1918.

The amount of copra marketed during 1917 was 1,195 tons, for which the amount received was $123,791.98. The contract price, $136.92 per ton, was the highest ever received, that for the previous year being but $103.52.

Appropriations have been granted to increase the water supply of the Naval Station and to erect barracks for the enlisted men stationed there, and these improvements are now under construction.

VIRGIN ISLANDS

General Conditions.—Governor J. H. Oliver's report shows that a good beginning has been made in the improvement of conditions as he found them when the Virgin Islands were taken over by the United States. Perhaps the most important work is that of officers of the Medical Corps of the Navy who have been detailed to the Sanitary Department. Important steps, including the reorganization and equipment of hospitals, and a detailed sanitary survey of the town of St. Thomas, have already been taken which will greatly improve the public health. Increased efficiency in the police force has been brought about by a reorganization of that branch. By executive orders the administration of the customs service and the postal, lighthouse and quarantine services was transferred to appropriate departments of the Federal Government.

Although financial conditions have not improved during the year, through the exercise of rigid economy the Government has been able to operate without creating a greater deficit than could be met from the money appropriated for the islands in the organic act. Efforts are being made to make the islands self-supporting as early as possible. There has always been considerable poverty in the islands, which was increased by the curtailment of shipping during the war and the consequent deprivation of incomes formerly obtained from coaling and the tourist trade. No extensive construction work has been carried on, due to lack of funds.

The Governor reports:

> The inhabitants appear to be very much pleased with the transfer of the islands to the United States and have shown their loyalty and desire to cooperate in many ways. Many have joined the American Red Cross and are working to advance its interests in a substantial way. In spite of the poor financial conditions of a large majority of the people, the islands subscribed more than their quota in the last Liberty Loan drive and received honor flags.

Agriculture.—The most important agriculture in the islands is in St. Croix, where the sugar-cane industry predominates. Corn, cotton, ground vegetables and fruit are also grown, but in rather limited quantities. A corn mill has been installed in this island during the year. In St. Thomas and St. John the principal industry is stock raising, although this is not extensive. Some fruit and vegetables are raised, but results obtained from any kind of agricultural pursuits are discouraging due to lack of sufficient moisture. If the land could be irrigated, the production could perhaps be increased 50 per cent.

Education.—Very little improvement has been made in the public schools owing to the lack of properly trained personnel and adequate equipment. Only native teachers are employed. On April 1, 1918, most of the schools formerly maintained by the churches, the Government contributing to their support, were taken over by the Government. At the end of the school year 1917-18 there were 3,819 pupils in the 37 schools, public and private. The number of teachers employed was 124.

Census of the Islands.—The first census of the islands under the auspices of the U. S. Government was taken in November, 1917. It shows that although the islands were under the Danish flag for 245 years, the language of the people is English. The census report gives these statistics:

Population: St. Croix,	14,901
St Thomas,	10,191
St. John,	959
	26,051
Density of population per square mile	197
Number of illiterates, 10 years or over	5,281
Total area of islands, square miles	132
Area in farm land, acres	69,892
Average size of farms, acres	162½
Value of farm property	$3.706,911
Value of crops for year ending October, 1917	522,606
Number of manufacturing establishments	84
Number of persons engaged in manufacturing	842
Capital invested in manufactures	$1.429,524
Number of persons engaged in fisheries	380
Capital invested in fisheries	$11,002
Exports to the United States	$1,259,607[1]
Imports from the United States	1,416,342[2]

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[1] Sugar and rum, hides and skins, cabinet woods.

[2] Breadstuffs, cereals, bituminous coal, iron and steel products, boots and shoes, meat and dairy products, oils, lumber, refined sugar.

VIII. LAW AND JURISPRUDENCE

Francis M. Burdick

FOREIGN JURISPRUDENCE

Legislation.—In Great Britain nearly every statute bears the impress of war conditions. For example, the Workmen's Compensation Act was amended by the War Addition Act, 1917 (7 & 8 George V., Ch. 42), increasing compensation during the war and for six months thereafter in cases of total incapacity. The Corn Produce Act, 1917 (7 & 8 George V., Ch. 46) has for its object the encouragement of the production of corn by fixing a minimum price for corn and oats and a minimum wage for agricultural workmen. Even the Representation of People Act, 1918 (8 George V., Ch. 64), goes farther towards universal suffrage than it would have gone but for the war. (See also III, *The British Empire.*)

Judicial Decisions: Prize Cases.—The prize cases decided by Sir Samuel Evans during the year possess great value, not only as judicial precedents but as historical documents. Prominent among them is the *Leonora* case (1918, P. 182, 118 L. T. 362), in which the learned judge reviews with great ability the English doctrine as to the effect of orders-in-council upon the law of nations and pays a noble tribute to Sir William Grant.

Trading with the Enemy.—Trading with the enemy subjects the violating trader to various punitory proceedings under the British statute, and gives to domestic creditors priority over alien-enemy creditors in the distribution of the violator's assets (*In re* Cedes Electric Traction, Ltd., 1918, 1 Ch. 18, 87 L. J. Ch. 9; and *In re* Fr. Meyers Sohn, 1918, 1 Ch. 169, 87 L. J. Ch. 103).

Contracts.—The effect of war on contracts is the subject of careful consideration in Naylor, Benzon & Co. *v.* Krainische Industrie—Gesellschaft (1918, 1 K. B. 331). After tracing the growth of legal doctrine on this topic, the court held that during war all intercourse with enemies is forbidden. Hence, if a contract existing when war breaks out requires any intercourse between the contracting parties during the war, the contract is absolutely dissolved as to all future duties, rights and obligations. As this is a rule of public policy, it cannot be affected by agreement of the parties changing it, as for example, that war shall only suspend the operation of the contract (*cf.* Ertel Bieber & Co. *v.* Rio Tinto Co., 1918, A. C. 280).

The effect of war on contracts came up in a different form in Blackburn Bobbin Co. *v.* T. W. Allen & Sons (1918, 1 K. B. 540. — L. J. K. B. —, 118 L. T. R. 222). Early in 1914 defendants sold to plaintiffs a quantity of Finland birch at a specified price, free on rail at Hull. On the outbreak of war, in August, it became impossible for defendants to obtain Finland timber and deliver it to plaintiffs. When sued for non-delivery, defendants contended that the contract had been dissolved by the war. The court refused to take this view, holding that the cessation of the state of peace did not go to the root of the contract, within the doctrine of Krell *v.* Henry (1903, 2 K. B. 740) and kindred cases. That doctrine had been stated as follows:

> If the surrounding circumstances necessarily require the assumption by both parties that a certain state of circumstances should continue to exist when the performance is due, then, if that state of circumstances does not in fact exist when the time comes for performance of the contract, the contract is dissolved.

Crown servants are not protected from liability to dismissal at pleasure even by a special contract, unless that is incorporated in a statute (Hales *v.* The King, — K. B. —, 145 L. T. 256).

A passenger who fails to read the conditions plainly printed upon his ticket is bound by them as a part of his contract. Accordingly, if one of the conditions is that in case of injury through the carriers' negligence, he cannot recover more than £10 damages, that sum is the limit of recovery (Hood *v.* Anchor Line, 1918, A. C. —, 87 L. J. P. C. 156, affirming 1916 S. C. 547, 55 S. L. R. 48). The plaintiff sued for £10,000.

But it is often a question of fact whether a condition is so written or printed that a reasonable business man would see it and consider it a part of the contract (Roe *v.* R. A. Naylor, Ltd., 1918, 87 L. J. K. B. 958, affirming 1917, 1 K. B. 712, 116 L. T. R. 542). In this case the oral contract for the sale and purchase of a quantity of timber contained no condition. Later the seller delivered to the buyer a sold note, on the side of which was written: "Subject to these being on hand when the order reaches the head office." The trial court found that the seller did not take reasonable steps to bring this clause to the purchaser's notice and that he did not notice it; hence it formed no part of the contract. This was approved on appeal.

A contract by an agent of a firm engaged in the wood and slate business that he shall not at any time during five years after leaving the service of the firm be engaged either alone or with others in the wood and slate business in certain counties is valid. But if the employers bind him not to engage "in any business whatsoever connected with the wood and slate business," they overreach themselves. Such a vague and general restraint upon the employee's activities is more than is necessary to the employer's protection and, therefore, avoids the contract. (Whitmore *v.* King, 1918, — K. B. —, 145 L. T. J. 257.)

Damages for Breach of Contract.—Plaintiffs claimed £474 1s. 7d. as damages for defendants' refusal to carry out their contract, under which plaintiffs were to manufacture for them a quantity of steel cartridge clips. Defendants admitted that the sum represented the profits which plaintiffs would have made had the contract been performed, but contended that they were not liable for that sum inasmuch as plaintiffs' mills and machinery had been fully occupied with other work as profitable as that called for by the contract. The trial court held that evidence in support of this contention was inadmissible and gave judgment for the plaintiffs. In the Court of Appeals the evidence was held admissible, and this decision was affirmed by the House of Lords. (John Hull & Sons, Ltd. *v.* Edwin Showell & Sons, Ltd., 1918, A. C. —.)

Specific Performance.—The difficulties which beset a vendor who sues a vendee for specific performance are illustrated by McGrory *v.* Alderdale Estate Co. (1918, A. C. 503, reversing 1917, 1 Ch. 411, 116 L. T. R. 391). The vendee refused to perform on the ground that the vendor could not give a good title. The vendor insisted that as the vendee knew of the defects in the title when he entered into the contract to purchase the property, the vendor was exonerated from showing a good title. Evidence of such knowledge was held by the trial court inadmissible by the registrar to whom the question of the title was referred. This decision was reversed by the Court of Appeals. The latter decision was in turn reversed by the House of Lords, which held that while such evidence was admissible, it should have been offered in the trial court and not before the registrar.

The specific performance of a contract for the sale of unascertained goods will not be granted under Section 52 of the Sale of Goods Act, 1893 (Thames Sack & Bag Co., Ltd. *v.* Knowles & Co., 1918, — K. B. —, — L. J. K. B. —). Such would be the holding, undoubtedly, under the corresponding section (68) of the Uniform Sales Act in the United States.

A future but vested right differs from a future contingent interest. Hence a lease to commence more than 25 years after its date is not under the ban of legal remoteness, according to Mann, Crossman & Paulin *v.* Land Registry Registrar (1918, 1 Ch. 202, 87 L. J. Ch. 81).

Principal and Agent.—Is a bank liable to a customer who makes a losing investment as the result of advice given him by the manager of one of its branches? Both the Court of Appeals and the House of Lords gave a negative answer to this question in Bankburg *v.* Bank of Montreal (1917, 116 L. T. R. 42, 1 K. B. 409; 1918, A. C. —). It was held also that a letter from the general manager of the bank to its local managers, asking them to place themselves at plaintiff's disposal if he should apply to them for assistance or advice, did not give branch managers any special authority to advise plaintiff as to this unfortunate investment. In the absence of such special authority, there was no duty on the bank to advise plaintiff carefully.

A curious and interesting question was raised in Weld-Blundell *v.* Stephens (1918, — K. B. —, — L. J. K. B. —). Defendant was employed by the plaintiff to investigate the conditions and affairs of a certain company in which he had large financial interests. Plaintiff sent a letter to defendant containing libellous statements about certain directors of the company, which defendant showed to them while engaged in his investigation. They sued plaintiff for libel and recovered heavy damages, the jury finding that he had published the libel with actual malice, thus forfeiting the privilege of the occasion arising from his interest in the company. Thereupon he sought redress from defendant, on the ground that the latter had violated an implied term of his contract of employment, namely, to keep secret all communications made to him by his employer. The court declared that there was no such implied term.

Forged Check and Customers' Negligence.—The liability of a bank to a customer whose forged check it has paid has been settled in Britain by the decision in London Joint Stock Bank *v.* Macmillan (1918, A. C. —, reversing 1917, 2 K. B. 439, 117 L. T. R. 202), in accordance with the doctrine laid down in Young *v.* Grote (1827, 4 Bing 253). Although that doctrine has been criticized on both sides of the Atlantic, it has now received authoritative statement and approval by the House of Lords. According to the Lord Chancellor:

> The ground upon which Young *v.* Grote proceeded was, according to the judgments of three out of the four judges, simply this, that if a customer in drawing a cheque neglects reasonable precautions against forgery, and forgery ensues, he is liable to make good the loss to the banker.

In the Macmillan case the check had been signed nearly in blank. The amount was not written out in words, and the figure "£2" was so placed as to permit the insertion of the figure 1 before the 2 and a cipher following it, so as to read "£120", which amount was paid by the bank and charged to the drawer's account. A check signed with such blank spaces was declared by some of the Lords not to differ in principle from a blank check. But the main ground of decision is that a customer of a bank is, by reason of his contractual relation with the bank, under an obligation to take reasonable precautions against forgery when drawing checks. On this ground the case is distinguished from Schofield *v.* Londesborough (1896, A. C. 514), a case against the acceptor of a bill which had spaces that facilitated forgery by raising the amount, and it overrules the Privy Council decision in Colonial Bank of Australia *v.* Marshall (1906, A. C. 559) for the courts of Great Britain. The latter case is said to be binding still on "all courts in Australia and probably on all courts oversea, whose final appeal tribunal is the King in Council."

Negotiable Instruments.—A draft drawn in the United States on an English bank in the following terms: "Sixty days after sight pay to the order of ourselves £1,464 9s. value received, and charge the same to the account of 100/ R. S. M. I. bales of cotton," is a negotiable instrument by English law. It is not an order conditional on the validity of the accompanying bill of lading for 100 bales of cotton, bearing the marks "R. S. M. I." In this case the bill of lading was forged, and the acceptors of the draft, who had paid it to a holder in good faith, sought to recover the amount of the draft on the ground that it was not a negotiable instrument but an order conditional upon the validity of the bill of lading (Guaranty Trust Co. of New York *v.* Hannay & Co., 1918, 1 K. B. 43). The court held that the case was to be decided according to American law, and that the opinion of Noyes, J., in Hannay *v.* Guaranty Trust Co. (1911, 187 Fed. 686) must be accepted by a court of first instance in England as a correct statement of that law, namely, that the bill of exchange was conditional and hence non-negotiable.

Purchaser for Value.—This much discussed phrase came up for application in Hosack *v.* Robins (1918, 2 Ch. — 87 L. J. Ch. 545) in peculiar circumstances. The judgment creditor of an undischarged bankrupt obtained a charging order for the amount of the judgment on shares owned by the bankrupt in a certain company. Later the assignee in bankruptcy sold these shares subject to all proper charges, and the purchaser was permitted to hold them from the judgment creditor's claims, on the ground that his charging order was not a "contract, dealing or transaction by or with the bankrupt for a valuable consideration" under Section 49 of the Bankruptcy Act, 1883.

Statute of Frauds.—That the statute of frauds may be used to absolve one from an honorable obligation to the harm of another is shown by a recent decision of the House of Lords in Morris *v.* Baron & Co. (1918, A. C. 1, 87 L. J. K. B. 145). Plaintiff contracted in writing to sell and deliver to defendant certain goods. After the delivery of a part the parties made an oral contract absolving the plaintiff from further delivery unless the defendant requested delivery of the rest of the goods. The defendant, did so request, but the plaintiff refused and brought action for the price of the goods delivered. The defendant sought to counterclaim damages for non-delivery of the goods requested under the oral contract. The House of Lords felt constrained to refuse such counter claim. though holding the second contract effective in absolving the plaintiff from performing the balance of his original contract. On the latter point the case really overrules Noble *v.* Ward (1867, L. R., 1 Exch. 117, 2 *ibid.*, 135), though the noble Lords assure us that it is only "distinguished" on the ground that the statutory language before the court in the earlier case was that the oral contract should not be "allowed to be good," while in the latter it should not be "enforced by action."

Defamation.—The rule long established in England, that words spoken by a member of a judicial tribunal during the progress of the trial are absolutely privileged, has been applied to tribunals organized under the Military Service Act, 1916 (Copartnership Farms Limited *v.* Harvey Smith, 1918, — K. B. —, — L. J. K. B. —, 118 L. T. 541).

Trespass.—The owner of diseased animals may be liable not only for the herbage eaten by them while trespassing, but for the detention of animals belonging to the owner of the land trespassed upon because of their exposure to the disease. Damages claimed for such detention are not legally remote in an action for trespass, and the animals continue to be trespassers while detained under an order duly made by the proper authority. (Thayer *v.* Purnell, 1918, — K. B. —, — L. J. K. B. —.)

Rylands v. Fletcher.—The absolute liability in damages of a landowner who brings and keeps upon his land for his own purpose anything likely to do mischief if it escapes, which was promulgated in Rylands *v.* Fletcher in 1866, has been applied by the House of Lords in a case where the proximate cause of the injury was a *damnum fatale*, or act of God. Lord Blackburne, in stating the rule as above given, suggests that the land owner might be excused where "the escape was the consequence of *vis major*, or the act of God." Decisions to this effect have been made by lower courts in England, and the tendency of judicial decisions there has been to find something in the facts of the case under consideration that would take it out of the rule. But the House of Lords appears disposed to check this tendency. In Corporation of Greenock *v.* Caledonian Ry. (1917, A. C. 556, 117 L. T. 483) an unprecedented storm damaged the railway company's property because the Corporation had obstructed a stream with culverts. There was no negligence on the part of the Corporation, but it was held to have accumulated the water on its own land by these obstructions at its peril. One of the learned Lords declared: "Assuming an act of God, such as a flood wholly unprecedented, the damage in such a case results not from an act of God, but from the act of man in that he failed to provide a channel sufficient to meet the contingency of the act of God."

Carriers.—The Government as a common carrier is subject to legal rules, as is a citizen. If it issues a bill of lading for the carriage of goods with an exception from liability for any loss caused by acts of the King's enemies, and the goods are lost by the torpedoing of the carrying vessel, it will still be liable if it caused a deviation and change in the character of the adventure upon which the vessel started (Attorney-General *v.* Benjamin Smith & Co., 1918, A. C. —). The vessel's voyage was from Melbourne to London, but for some months before its loss it was used by the Government as a storeship at Mudros and Imbros for military forces operating at Gallipoli.

Master and Servant.—Undoubtedly the master is bound to use reasonable care to have the premises where the servant works free from any concealed danger. But it rests upon the servant to give evidence of lack of such care when he sues for injury caused by defective premises. This he failed to do in Cole *v.* DeTrafford (1918, 118 L. T. R. 314, 1 K. B. 352). He was injured by the fall of a large pane of glass from the top of a garage door while he was acting as chauffeur. The glass had been fixed in place by a beading, a part of which had fallen off, and a nail had been driven in by some one to take the place of the beading. The servant had been opening and closing the door daily for a fortnight before the glass fell, and had cleaned the glass with a hose pipe, but had not noticed the defect. Nor was any evidence offered that the master knew of the defect.

It is not often that a master secures damages from a servant for leaving his employment without notice. That he is legally entitled to such damages is held in Payzu Limited *v.* Hannaford (1918, — K. B. —, — L. J. K. B. —). Said the court:

> Unless there is an express agreement to the contrary, in every contract of service there is an implied term that notice shall be given by one party to the other before the contract can be determined, the length of such notice to depend upon the circumstances of the case.

Liability of Superior Officer to Inferior. — The Court of Appeals has held that the non-liability of a superior officer for the malicious retirement from the service of an inferior was established by Dawkins *v.* Rokeby (7 H. L. 744). The House of Lords expressed the opinion that the question of liability in such a case was left open by the Dawkins case, and gave the plaintiff leave to amend his statement of claim (Fraser *v.* Balfour, 1918, A. C. —). The progress of the action will be followed with interest. Similar questions are considered in Fraser *v.* Hamilton (1917, W. N. 13).

Nuisance.—Overcrowded street cars are not a nuisance under the following statutory definition: "An unlawful act or omission to discharge a legal duty which act or omission endangers the lives, safety, health, property or comfort of the public or by which the public are obstructed in the exercise or enjoyment of any right common to all His Majesty's subjects," according to Toronto Ry. Co. *v.* The King (1917, A. C. 630, Ann. Cas., 1918, A. 630). The overcrowding affected only those members of the public who had obtained from the Company licenses to enter the cars. If the Company was guilty of any breach of duty, it was of a contract duty towards individual passengers.

Proximate Cause. — Whether the loss of a steamer was due to warlike operations or to a "collision arising as a sea risk," was the question at issue in British & Foreign Steamship Co., Ltd. *v.* The King (1918, — K. B. —, 87 L. J. K. B. 910, affirming 117 L. T. R. 94). The steamer was sunk by coming into collision with a French battleship while engaged as a transport for troops from Gallipoli. Both steamer and battleship were running without lights, pursuant to Admiralty orders, and it was found as a fact that the collision was not due to any negligence on the part of those in control of the steamer. The court held that the "steamer was lost by the proximate, direct and immediate cause of warlike operations." A similar question arose in Henry & McGregor, Ltd. *v.* Martin (1918, — K. B. —, — L. J. K. B. —). Plaintiff's vessel was sunk by ramming what its master took to be a submarine. Its loss was held to be caused by warlike operations and not by marine risks.

Workmen's Compensation.—Workmen's compensation acts continue to give the courts much trouble, as witness Clawley *v.* Carlton Main Colliery Co., Ltd. (1918, A. C. —, reversing 1917, 2 K. B. 691, 117 L. T. R. 324). The defendant settled the claim of an injured workman on the basis of finding him work at a specified weekly wage and paying him in addition the weekly sum of 8s. 10d. as compensation. Later the defendant sought to redeem this weekly compensation payment. He was allowed to redeem by the county court, whose decision was affirmed by the divided Court of Appeals but reversed by the House of Lords, on the ground that the statute allowed redemption only where the weekly payment represented the full measure of compensation to which the workman was entitled. Here the weekly sum was only for the partial incapacity which the injury had caused the workman.

Does a workman who is injured while sleeping in a hut supplied by the employer by reason of the hut's being blown down by a violent wind sustain an injury by accident arising "out of or in the course of his employment"? The question was answered in the affirmative by the county court, but in the negative by the Court of Appeals in Philbin *v.* Hayes (1918, — K. B. —, 87 L. J. K. B. 779).

A railroad employee who is injured by alighting from a train in motion, solely for his convenience and knowing that it is not the proper place for alighting, is not the victim of an accident arising out of and in the course of his employment (Wilson *v.* London & N. W. Ry. Co., 1918, — K. B. —, 87 L. J. K. B. 843).

Wills. — Soldier minors in actual military service may dispose of property by "will", though civilian minors of the same age may not (*In re* Wernher, 1918, 1 Ch. 339, 87 L. J. Ch. 255). The Wills (Soldiers and Sailors) Act, 1918, is but declaratory of existing law. In the Court of Appeals the case is reported in (1918) 2 Ch. 82, 87 L. J. Ch. 372, W. N. 141. Justice Younger's opinion in the lower court contains a learned *résumé* of the law of wills from the time of Trajan to the Victorian era.

The provision in a will bequeathing £100 to the Dominican Fathers, Black Alley, Kilkenny, for masses, is void, as being a gift for superstitious uses, under statute 1 Edward VI, Ch. 14 (*In re* Egan; Keane *v.* Moore, 1918, — Ch. —).

Registration of Business Names.—The Act of 1916 on the registration of business names was primarily a war measure. Its chief object was to secure a public statement as to the ownership of every business establishment so that the property of aliens could be identified easily. But it has been judicially declared to embody sound principles, and without doubt it will survive the war and remain a useful statute for the discouragement of dishonest business enterprises. It requires not only the registration of the names of the persons carrying on a business, but all business literature must show the names of the several individuals, their surnames and the initials of the Christian names. If any are not of British nationality, their nationality must be given. This includes all trade catalogues or circulars as well as all business cards and letters. The courts, while approving the statute, are not disposed to apply its very wide language with over-strictness. In Daniel *v.* Roger; Fantini, Claimant (1918, 1 K. B. 149, 118 L. T. R. 313; affirmed, 1918, 2 K. B. 228), the purchaser of a business had failed to comply with the statute. A judgment creditor of the former owner levied on the stock and insisted that the purchaser's default prevented her from asserting title to the property. This view was rejected, the court holding that the right of ownership as against the levying creditor was not "a right arising out of any contract made or entered into by or on behalf of such defaulter," but rested on her common-law title by possession, and that she was not called upon to enforce her contract at all.

Parties to a Fraud.—The principle that when two persons concur in committing a fraud, neither of them will receive assistance from the courts to relieve him from the consequences, was applied in the case of Gascoigne *v.* Gascoigne (1918, 1 K. B. 223, 87 L. J. K. B. 333). "The husband with his wife's knowledge and connivance, concocted the scheme of putting his property in her hands while retaining the beneficial interest, for the purpose of misleading, defeating and delaying present or future creditors." Later, having separated from his wife, he sought a judicial declaration that she held as trustee for him. This was denied on the ground that "he could not be allowed to rebut the usual legal presumption that the transfer was made by him to his wife by way of gift."

AMERICAN JURISPRUDENCE

Legislation.—The most important legislation of the year affecting civil rights has concerned the war; it is considered in the *résumé* of judicial decisions which will be found below. Next in importance is the body of uniform state laws, which increases yearly, as shown by the following statistics:

Uniform Negotiable Instruments Act, adopted now in all the States and Territories of the Union except Georgia and Texas.

Uniform Warehouse Receipts Act, adopted in all the States and Territories of the Union except Arizona, Arkansas, Florida, Georgia, Hawaii, Indiana, Kentucky, Mississippi, New Hampshire, North Dakota, Oklahoma, South Carolina and Texas.

Uniform Stock Transfer Act, adopted in Alaska, Louisiana, Maryland, Massachusetts, Michigan, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Tennessee and Wisconsin.

Uniform Bills of Lading Act, adopted in Alaska, Connecticut, Idaho, Illinois, Iowa, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New York, Ohio, Pennsylvania, Vermont, Wisconsin, and Washington.

Uniform Sales Act, adopted in Alaska, Arizona, Connecticut, Illinois, Maryland, Massachusetts, Michigan, Minnesota, Nevada, New Jersey, New York, North Dakota, Ohio, Pennsylvania, Rhode Island, Utah, Wisconsin and Wyoming.

Uniform Annulment of Marriage and Divorce, adopted in Delaware, New Jersey and Wisconsin.

Uniform Desertion and Non-Support, adopted in Delaware, Hawaii, Kansas, Massachusetts, North Dakota, Texas, Vermont and Wisconsin.

Uniform Probate of Foreign Wills, adopted in Alaska, Kansas, Louisiana, Maryland, Massachusetts, Michigan, Nevada, Washington and Wisconsin.

Uniform Marriage Evasion Act, adopted in Illinois, Louisiana, Massachusetts and Vermont.

Uniform Partnership Act, adopted in Alaska, Maryland, Michigan, Pennsylvania, Tennessee, Wisconsin and Wyoming.

Uniform Land Registration Act, adopted in South Carolina, Utah and Virginia.

Uniform Workmen's Compensation Act, adopted in Idaho and North Dakota.

Uniform Act for the Extradition of Persons of Unsound Mind, adopted in Nevada and Tennessee.

Uniform Cold Storage Act, adopted in Maryland and Utah.

That the existence and importance of these laws are not appreciated by the bench and bar is shown by the fact that in nearly a thousand cases arising under these statutes, attention was called to their provision in but 36 per cent. of the total number.

CONSTITUTIONAL LAW[1]

Judicial Decisions.—Many of the statutes and judicial decisions in the field of constitutional law have received consideration in other departments of the YEAR BOOK; the present article will attempt only a brief summary of cases which indicate the present trend of development of our constitutional law.

War Powers.—The war powers of the federal government are expounded with care in the Selective Draft Law Cases (245 U. S. 366, 38 Sup. Ct. 159). The constitutionality of the law was supported against all attacks in an opinion written by the Chief Justice which commanded the approval of the entire bench (see also *Criminal Law, infra*). In other decisions, of which U. S. *v.* Scott (248 Fed. 361) is a type, the power of Congress and state legislatures to regulate the moral conditions of camp life has been upheld.

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[1] Parts of this section were contributed by Prof. Charles K. Burdick, of Cornell University College of Law.

Liquor Legislation. — The attempt to make states "bone-dry" has resulted in some interesting decisions. The Supreme Court of Washington has upheld the constitutionality of a statute forbidding the manufacture of intoxicating liquors even for the private use of the manufacturer (State *v.* Fabbri, 98 Wash. 207, 167 Pac. 133). It was also held that a grape grower who crushes the grapes and leaves the juice to ferment is a manufacturer within the statute.

In U. S. *v.* Mitchell (245 Fed. 601) it was held that interstate transportations of property by the owners for purely personal use is not interstate commerce, this on the ground that commerce connotes a business transaction. As the Supreme Court has given a very liberal interpretation to "commerce," it will not be surprising if the decision of the district court is reversed.

Social Legislation. — Probably the most important and the most criticised decision in the field of social legislation is that of Hammer *v.* Dagenhart (247 U. S. 251, 38 S. C. 529), holding unconstitutional the Federal Child Labor Act. In the opinion of the Supreme Court, written by Justice Day, the law was not a regulation of interstate commerce. It was distinguished from the Federal pure food and liquor legislation on the ground that the thing transported in interstate commerce was not dangerous in itself. A dissenting opinion by Justice Holmes had the concurrence of Justices McKenna, Clark and Brandeis. (See also XV, *Labor.*)

Another important case is Buchanan *v.* Warley (245 U. S. 60, 38 Sup. Ct. 16, L. R. A., 1918, C. 210 and note; reversing 165 Ky. 559, 177 S. W. 472, Ann. Cas., 1917, B. 149), holding unconstitutional a segregation ordinance of Louisville. The ordinance divided the city into white and colored blocks according to the majority of residents in each block, putting similar restrictions upon white and colored persons with regard to moving from blocks of one color to those of the other, but not prohibiting the use by owners of property already acquired. Although it was carefully drawn so as to preserve an equality between the races, it fell under the ban of constitutional prohibition against taking property without due process of law.

Public Use and Public Utility.— Montana has upheld a law providing for loans upon certain conditions to farmers who are unable to secure seed without such loans. It is deemed a law which serves a public use. (State *ex rel.* Cryderman *v.* Wienrich, 54 Mont. 390, 170 Pac. 942; see also note on farm loans in L. R. A., 1917, A. 495.)

That land may be taken for a temporary logging road is held in Blackwell Lumber Co. *v.* Empire Mill Co. (28 Idaho 556, 155 Pac. 68, Ann. Cas., 1918, A. 189). The court considered that the construction of roads for the transportation of logs was necessary to the proper development of the timber resources of the state, and hence land taken for such roads is taken for a public use.

That a municipal ice and cold-storage plant for the benefit of the inhabitants of the municipality is a public utility is the view taken by the court in Saunders *v.* Mayor, etc., of the town of Arlington (147 Ga. 581, 94 S. E. 1022). Accordingly, bonds were validly issued by the town for the erection of such a plant, under a statute authorizing the Board of Aldermen to issue bonds whenever they should deem it proper and expedient to do so for the purpose of making any public improvement.

A Maine statute authorizing the maintenance of municipal coal and wood yards in order to supply the inhabitants with fuel at cost has been upheld by the Supreme Court as a method of taxation for the support of a public utility. It is a proper exercise of a city's right to promote the health, comfort and convenience of its inhabitants. (Jones *v.* Portland, 245 U. S. 217, 38 Sup. Ct. 112, affirming 113 Me. 123, 93 At. 41.) A similar doctrine is applied in Andrews *v.* South Haven (187 Mich.

294, 153 N. W. 827, Ann. Cas., 1918. B. 100), holding that a municipal electric plant had power to wire private premises and provide fixtures for the use of its electricity.

The constitution of South Dakota prohibits the state or any political subdivision from engaging in any private enterprise. The city of Mitchell proposed to install a telephone system for the municipality. In an action (Spangler *v.* City of Mitchell, 35 S. D. 335, 152 N. W. 339, Ann. Cas., 1918, A. 373) brought to enjoin "its officers, agents, servants and attorneys from issuing bonds" for the construction of the system, it was judicially declared that the constitutional provision

> does not prohibit a municipality from owning, constructing or operating any public-service utility for the convenience of its inhabitants, when the service is such as to bring it fairly within the principles governing a legitimate exercise of the taxing power; and the acquisition and operation of a telephone system is a legitimate exercise of the power of a municipality, by reason of which municipal indebtedness may be incurred.

Agreement between a State and a Foreign Municipality.—A novel question was decided in McHenry County *v.* Brady (37 N. D. 59, 163 N. W. 540). It was there held that a local drainage board of North Dakota can constitutionally enter into an agreement with a Canadian municipality for the construction of a dam across the international boundary, and that such agreement does not violate Art. 1, Sec. 10, of the Constitution forbidding a state to enter into any agreement or compact with another state or foreign power without the consent of Congress. The court makes a distinction between agreements which do and those which do not "encroach upon or interfere with the just supremacy of the United States," which is a question of fact. In the present case the agreement was nonpolitical.

Public Trial of Criminals.—That a criminal is entitled to a public trial, but a trial not too public, seems to be the doctrine resulting from State *v.* Keeler (52 Mont. 205, 156 Pac. 1080, Ann. Cas., 1917, E. 619) and Roberts *v.* State (100 Neb. 199, 158 N. W. 930, Ann. Cas., 1917, E. 1040). In the former case it was held that the court violated the criminal's constitutional right to a public trial by ordering the bailiffs to refuse admission to those not then in the court room and prevent those who were in the room, except newspaper men and attorneys, from leaving. In the latter case his constitutional right was also invaded by removing the trial from the court room to a theatre in order to seat and accommodate the people applying for admission.

Compulsory Work on Highways.—That a state has the legal right to compel its citizens to labor upon its highways has rarely been questioned. It would seem to follow that the state may compel its citizens to use their animals and wagons in this service without compensation therefor. This was held in Galoway *v.* State (139 Tenn. —, 202 S. W. 76), but the court declared it was unconstitutional to require the owners of the teams to provide their feed while so used.

Recall of Judges.—That a constitutional provision for the recall of judges may lend itself to unseemly interference with the conduct of pending litigation is shown by Marians *v.* People (— Col. —, 169 Pac. 155). During the progress of two criminal cases Marians circulated a petition for the recall of the judge sitting in these cases, attacking him savagely for admitting one of the prisoners to bail while refusing it to the other. Such an attack was an attempt to interfere with the course of judicial proceedings, and but for the constitutional provision it would have constituted a clear case of contempt of court. But it was held that as the constitution permitted a recall to be demanded and required that the petition therefor should contain a general statement of the grounds on which the recall is sought, Marians was not guilty of contempt as his statement was privileged.

Police Power of States.—In the exercise of their police power the states are permitted to interfere seriously with interstate commerce, as shown by Hebe Co. *v.* Calvert (246 Fed. 711). The plaintiffs manufactured a wholesome product of evaporated skimmed milk and vegetable fat, which they labeled properly under the U. S. Pure

Food Act and shipped to various states. Ohio had a statute prohibiting the sale of condensed milk made from skimmed milk. Plaintiffs sought to enjoin the enforcement of the statute against their product but failed, the court following the oleomargarine case of Plumley *v.* Massachusetts (155 U. S. 461).

Even when interstate commerce is not concerned, state legislation or city ordinances may exceed the limits of the police power, as shown by State *ex rel.* Sampson *v.* City of Sheridan (— Wyo. —, 170 Pac. 1), where a municipal ordinance prohibited any person from engaging in the business of using cement without giving a bond guaranteeing the proper construction of cement products made by him.

In New York it is held (Doscher *v.* Sisson, 222 N. Y. 387, 118 N. E. 789) that the legislature did not exceed its police power in authorizing the excise commissioner, with the governor's approval, to suspend the privilege of selling intoxicating liquors in proximity to camps or barracks of state or Federal troops. Nor did the act delegate legislative power to the commissioners. The power exercisable by the commissioner and governor was executive.

A similar holding was made in Cook *v.* Burnquist (242 Fed. 321), upholding the Minnesota statute creating a Public Safety Commission, and granting to that body during war power to do all acts not inconsistent with the state or Federal constitutions and laws which are necessary and proper for the public safety. An order of the commissioner closing all saloons from 10 p. m. to eight a. m. was upheld. Another Minnesota statute declared it unlawful to print or circulate any matter advocating that men should not enlist in the military or naval forces of the United States or of the state. Defendants published a pamphlet tending to prevent enlistments, and, upon being indicted, demurred to the indictment. The demurrer was overruled, the court declaring (State *v.* Holm *et. al.*, 139 Minn. 267, 166 N. W. 181):

> That the state is inhibited from exerting its police power to obstruct the operations of the National Government or to regulate matters controlled and regulated by the National Government, does not mean that in time of war it may not make the national purposes its own purposes to the extent of exerting its police power to prevent its own citizens from obstructing the accomplishment of such purposes.

A pure-seed law passed by the Tennessee legislature, regulating the standard of purity and the labels on packages but exempting resident growers who sold seed on their own premises, has been held valid (State *v.* McKay, 137 Tenn. 280, 193 S. W. 99, Ann. Cas., 1917, E. 158).

It is a competent exercise of the police power to destroy orange trees suffering from a disease which is very infectious and for which no cure has been discovered, according to Louisiana State Board of Agriculture *v.* Tanzmann (140 La. 756, 73 So. 854, Ann. Cas., 1917, E. 217). Also to pass a Farm Loan Act to help farmers in getting loans on their lands, though it confers on this class privileges not accorded to others; the legislature believed that the statute was necessary to develop the resources of the state and add to the prosperity of all classes (Hill *v.* Rae, 52 Mont. 378, 158 Pac. 826, Ann. Cas., 1917, E. 210). Also to make it "a misdemeanor for a person to sell or give away, or to advertise or offer for sale, any instrument or article, drug or medicine, for the prevention of conception, or to give information orally, stating when, where or how such an instrument, article or medicine can be purchased or obtained" (People *v.* Sanger, 222 N. Y. 192, 118 N. E. 637). A city ordinance is within this power which renders "unlawful the maintenance of stock pens within 300 ft. of any hotel or private residence in the municipality without a permit from the city council, and providing that the words stock pen should include any lot wherein more than six head of cattle were kept" (*Ex parte* Broussard, 74 Tex. Crim. 333, 169 S. W. 660, Ann. Cas., 1917, E. 919). But a California statute was held not to be a valid exercise of the police power which required every dealer selling imported eggs to stamp them as "imported" and to have on his place of business a sign, "Imported Eggs Sold Here," the court holding that the obvious purpose of the law was not to protect the public health against stale or unwholesome eggs, but to prejudice buyers against imported eggs in favor of the state product.

A statute regulating the business of chattel-loan brokers is held a valid exercise of the police power in Wessel *v.* Timberlake (95 O. St. 21, 116 N. E. 43, Ann. Cas., 1918, B. 402). A city ordinance making it unlawful to drive a vehicle in Kansas City carrying intoxicating liquors or advertising any manufacturer of or dealer in intoxicants has been held valid in Kansas City *v.* Jordan (99 Kans. 814, 163 Pac. 188, Ann. Cas., 1918, B. 273).

State Control of Municipal Officers.—Municipal self-government does not render municipal officers immune from state control (State *v.* Linn, 49 Okla. 526, 153 Pac. 826, Ann. Cas., 1918, B. 139). A municipal chief of police was removed from office by state authorities for failure to enforce the liquor ond disorderly-house laws. The court expressed the opinion that:

> The enforcement of the laws relating to liquor, gambling and prostitution are matters within the sovereign power of the state, which it has not seen fit, either by the Constitution or the statutes to completely surrender into the hands of city officials, and the power to enforce obedience to its statutes is necessarily an inherent attribute in the power to enact them, for if it be once conceded that the state may not by proper measures enforce its regulations, the regulations themselves become futile and ineffective, except so far as the sentiment of any particular community may demand that the same be enforced, or so far as the officers thereof may see fit so to do, according to their particular personal views upon the matter.

Restraint of Trade.—The Chicago Board of Trade had a rule that members should not purchase or offer to purchase, during the period intervening between its daily sessions, termed the "Call," grain "to arrive" at any price but that of the closing bid at the "Call." This rule was assailed by the Government as a violation of the anti-trust law, being in restraint of trade. The Government contention was upheld by the lower court, on the ground that the rule thus fixing prices was made by a body of men strong enough to control this branch of trade. It was repudiated by the Supreme Court, which declared that

> the legality of an agreement or regulation cannot be determined by so simple a test as whether it restrained competition. Every agreement concerning trade, every regulation of trade, restrains. To bind, to restrain, is its very essence. The true test of legality is whether the restraint imposed is such as merely regulates, and perhaps thereby promotes competition, or whether it is such as may suppress or even destroy competition.

Applying this test to the facts, the Court held the rule to be a reasonable regulation of business and consistent with the provisions of the anti-trust law. (Board of Trade of Chicago *v.* U. S., 246 U. S. 231, 38 Sup. Ct. 242.)

Election by Minority Vote.—An interesting case of this class is Sanders *v.* Rice (R. I. —, 102 At. 914). Plaintiff was a candidate for sheriff at an election by the Rhode Island General Assembly. His only opponent was ineligible for the office, and a statement of such ineligibility was made to the Assembly before the election. The fact of ineligibility was doubted by the majority, who proceeded to vote for this candidate. Plaintiff received but 37 out of 116 votes. He insisted that he was duly elected, and that the votes cast for the ineligible candidate had been thrown away. His contention was not sustained, the court holding that the majority had not cast their votes in willful defiance of law, but under a mistake as to the legal status of the candidate for whom they voted.

PROPERTY AND CONTRACTS

Illegal Contracts. — Judicial tribunals are not disposed to uphold contracts that bind the parties to withdraw their legal controversies from the courts. Accordingly, though the constitution of a mutual-benefit association provides that claims of its members for disability "shall be addressed to the systematic benevolence of the brotherhood and shall in no case be made the basis of any legal liability," a disabled member whose claim has been refused payment by the beneficiary board is entitled to bring an action therefor. A contract prohibiting suit and binding the claimant to submit to the caprice of the beneficiary board was declared illegal (Miller *v.* Brotherhood of Local Trainmen, 282 Ill. 430, 118 N. E. 713). Contracts by laymen to collect or settle claims for a percentage are generally deemed illegal, but Rohan *v.* Johnson (33 N. D. 179, 156 N. W. 936, Ann. Cas., 1918, A. 794) favors a modification of this doctrine.

Contract Not to Marry.—A contract the sole purpose of which is to restrain one of the parties from marrying is generally deemed opposed to public policy and therefore invalid. If, however, the agreement not to marry is for a limited period and incidental to the main purpose of a contract which includes it, the courts are disposed to enforce it. This is well illustrated by Fletcher *v.* Osborn (282 Ill. 143, 118 N. E. 446), where a person promised to transfer his entire property to another provided the latter managed his estate and remained unmarried until the promisor's death. The promisee was held entitled to have the property transferred by the promisor's representatives.

Extra Compensation to a Managing Partner.—An express contract between partners that the manager shall have extra compensation for his services is of course valid. Courts are not disposed, however, to find an implied contract for such compensation without strong evidence in its support, because it is the duty resting upon every partner, in the absence of a contrary agreement, to devote his time and energies to the partnership business. In Rains *v.* Weiler (101 Kan. 294, 166 Pac. 235) extra compensation was granted to the managing partner on the ground that a contract might be implied from a custom among partners in that locality and that kind of partnership business to give extra compensation to the manager. It is doubtful if any such inference would be drawn in a state adopting the Uniform Partnership Act (*q. v.*, Sec. 18)

Auction Sales.—That the bidder at an auction does not accept an offer, but makes one, is the doctrine of Freeman *v.* Poole (37 R. I. 489, 93 At. 786, Ann. Cas., 1918, A. 841). The plaintiff claimed that the defendant, by putting up certain land for sale at auction, offered to sell it to the highest bidder; that plaintiff was the highest *bona fide* bidder, as the next bidder, and the one to whom the property was knocked down, was an agent of the seller; and that plaintiff was entitled to a deed of the land. In the opinion of the court the offer was made by the plaintiff, and the pretended sale to defendant's agent amounted to a withdrawal of the property from the sale.

Gratuitous Undertaking.—A railroad company overcharged a shipper by mistake, and consequently was liable to a rebate for the excess. But this rebate could be lawfully paid only with the consent of the Interstate Commerce Commission. The company told the shipper that if he would execute the proper papers it would present them to the Commission and secure the consent. The shipper did as requested by the Company, but it failed to make the promised application during the statutory period for obtaining consent to the rebate. When sued by the shipper to recover damages he had sustained by its failure to perform its undertaking, it defended on the ground that its promise was gratuitous and did not subject it to any legal liability. The court refused to take this view of the transaction and adjudged the company liable. (Case *v.* Maine Central Ry., — N. H. —, 102 At. 532.)

Initial Carrier.—Under the Carmack Amendment a passenger may recover from the initial carrier for loss of baggage due to the negligence of connecting carriers, but no provision is made for personal injuries to the passengers; and railroad tickets in this country generally stipulate that the initial carrier acts only as agent for the connecting carriers and is not responsible beyond its own lines. In Harmon *v.* Barber (247 Fed. 1) the receivers of a railroad sold to Barber a ticket with the above provisions, from Toledo to Piqua over their own lines, and from Piqua to Columbus over the Pennsylvania lines. At Piqua they gave him an inter-depot transfer ticket to the Pennsylvania station, and he was injured through the negligence of the motor-car driver *en route.* The court held that the provision applied only to other railroad transportation. Moreover, as the initial carrier paid the motor-car driver for the transfer service he was its agent for that service.

Congress has declared telegraph companies to be common carriers. Does it follow that the Carmack Amendment applies to contracts by the initial telegraph company limiting liability for the negligent transmission of an interstate message? Williams & Sons *v.* Postal Telegraph Co. (122 Va. —, 95 S. E. 436) holds that it does, while Des Arc Oil Mill *v.* Western Union Telegraph Co. (132 Ark. —, 201 S. W. 273) holds that it does not.

Sale for Cash on Delivery.—In England and in states that have adopted the Uniform Sales Act, title passes under such a contract of sale. The only effect of the provision is to retain possession in the seller until payment (Uniform Sales Act, Sec. 19). This seems sound upon principle, but the Supreme Court of Missouri has held recently, in Hamra Bros. *v.* Herrell (200 Mo. App. —, 200 S. W. 776) that this term in a sale contract shows the intention of the parties to be that title is not to pass until cash is paid.

Purchaser for Value.—That one who takes title to property in payment of a precedent debt is a purchaser for value is held in the very carefully considered case of Sutton *v.* Ford (144 Ga. 587, 87 S. E. 799, Ann. Cas., 1918, A. 106, with extensive note). Accordingly, one who surrendered and satisfied a debt due him from the grantor of realty, upon receiving a deed of it, was allowed to hold it against one who had been defrauded into conveying it to the debtor-grantor.

Negotiable Instruments. — Defendant endorsed for the accommodation of the maker a note, drawn payable to order, but with a blank space for the payee's name. The maker filled in the name of X, but as X refused to buy the note, he struck out the word "order" and substituted the word "bearer," and sold it to plaintiff, who knew of the change. It was held that this was a material alteration of the note which discharged the defendant (First National Bank of Hartsville *v.* Wood, 109 S. C. —, 95 S. E. 140). As South Carolina has adopted the Uniform Negotiable Instruments Act, the case should have been decided under its provisions. If Sections 28 (5), 114 and 206 (the numbering is that of the New York Act) are considered, the decision cannot be sustained. The dissenting opinion is worthy of careful consideration.

Authorities differ as to whether the following clause in an otherwise negotiable instrument renders it non-negotiable: "All parties hereto . . . agree that this note may be extended from time to time by any one or more of us without the knowledge or consent of any one of the others of us, and after such extension the liability of all parties shall remain as if no such extension had been made." The Supreme Court of New Mexico has recently increased the ranks of jurisdictions holding that such a provision does not affect the negotiability of the paper (First National Bank of Albuquerque *v.* Stover, 21 N. M. 453, 153 Pac. 905, Ann. Cas., 1918, B. 145). The court rests its decision mainly upon the fact that bankers and business men treat such paper as negotiable, and that it is simply giving effect to prevailing commercial usage.

New York has been added to the column of states holding that a negotiable instrument void for usury in its inception is unenforceable even in the hands of an innocent holder for value (Sabine *v.* Paine, 223 N. Y. 401, 119 N. E. 849, affirming 166 App. D. 9, 151, N. Y. Supp. 735).

Fictitious Payee.—Plaintiff loaned money to the maker of a promissory note, and had a name which was not his own inserted as that of the payee. He intended, however, to treat the note as payable to himself, and thereafter brought suit upon it in his true name. His right to do so was challenged, on the ground that the name of the payee was fictitious. The court said:

> Whenever the name is inserted as payee without any intention that payment shall be made only in conformity therewith, the payee then becomes a fictitious person. In other words under

> the rule a fictitious payee means a fictitious person, who though named as payee in the note, has no right to it or the proceeds of it, because it was not so intended when the note was executed. Therefore whether the paper is to be considered as having a fictitious payee depends upon the knowledge or intention of the party against whom it is attempted to assert the rule, and not upon the actual existence or non existence of a payee of the same name as that inserted in the instrument; so that on the one hand a real person may be fictitious, and on the other a non-existing person may be real within this rule.

(Sorkland *v.* Storch, 123 Ark. 253, 185 S. W. 262, Ann. Cas., 1918, A. 668, with good note). Moreover, it is well established that in the absence of fraud, a person may contract in any name that he may choose.

Principal and Surety.—A curious case in which the surety was held to be discharged by the creditor's dealing with the principal is that of Scott & Garrett *v.* Greene River Lumber Co. (116 Miss. 524, 77 So. 309). A landlord had a statutory lien on his tenant's crops which entitled him to follow them into the hands of purchasers. After the sale of the crops by the tenant, who had not paid his rent, the landlord hired the tenant and paid to him wages beyond the sum owing for rent. The purchaser insisted that he was but a surety for the tenant's rent, and that he was discharged by the landlord's failure to apply the wages to satisfaction of the rent. His view was sustained by the court, though the weight of judicial authority appears to be opposed to the decision, so far as the duty of the creditor to set off the wages against the rent is concerned.

That a surety may be liable on a bond though the principal is not is held in Bolyard *v.* Bolyard (81 W. Va. —, 91 S. E. 529). Plaintiff was the obligee in a bond given by her husband, with defendant as surety, that the husband should treat the plaintiff kindly and provide for her properly. The husband violated the bond, and the plaintiff sued him and the surety. The husband escaped judgment because of the common-law rule that an action would not lie against him by the wife. The surety insisted that this defense of the principal discharged the surety also. But the court held that the disability of the husband to contract with the wife was purely technical, and that the personal incapacity of the principal to contract did not prevent a valid contract on the part of the surety.

Title to Personal Property by Estoppel.—An owner of personal property who leaves it in the possession of another is not estopped by that fact alone from asserting his title against even a purchaser of it for value and in good faith from the mere possessor (Alexander *v.* Busch, — Okla. —, 166 Pac. 900). English common law does not treat possession as "equivalent to a title," as does the French Civil Code. Nor does it presume a possessor to be the owner, as does the German Civil Code. A possessor is not a reputed owner at common law, though he is under certain statutes both in England and in this country. Even in the absence of a statute, however, the owner may estop himself from claiming title by putting the property into the possession and control of one whose business consists in dealing in such property (W. P. Fuller & Co. *v.* Longmire and Adams, 97 Wash. 254, 166 Pac. 623). By such conduct he confers upon the possessor an implied authority to dispose of it, and a *bona fide* purchaser for value from the possessor can hold it.

The Federal Government as a Land Owner.—The mere ownership of land by the United States does not oust the state where the land is situated from exercising legislative authority over it. An Idaho statute made the grazing of sheep under certain circumstances a criminal offense. Federal authorities undertook to permit the prohibited grazing of Government lands. Such permit was held ineffective to protect the grazer from conviction for violation of the statute (Omaechevarria *v.* Idaho, 246 U. S. 343, 38 Sup. Ct. 323, affirming 27 Idaho 797).

Liability for Injurious Food.—One who sells food products to the consumer warrants them fit for use as food. His liability for injuries caused to the buyer by unwholesomeness depends not upon his negligence in preparing or examining the food, but upon his contract. If he would escape the liability of warrantor of fitness, he must stipulate against liability when selling the food (Race *v.* Krum, 222 N. Y. 410, 118 N. E. 803; *cf* Sec. 15 of the Uniform Sales Act). When the vendors of unwholesome food, however, are sued not by their vendees, but by third parties injured by such food, their liability, if any, is in tort, and depends generally upon the negligence of the vendor (Ketterer *v.* Armour & Co., 247 Fed. 921). Here trichinae-infected sausage, manufactured by defendant and sold to a retailer who sold to plaintiff's employer, made plaintiff sick; but as no negligence on the part of defendant was shown, the plaintiff failed to recover damages.

Estate by Entireties.—A husband and wife were seized of certain lands by entireties. The husband killed the wife and then himself. But for the crime the wife's interest would have descended to the husband. His heirs claimed it, distinguishing the case from Riggs *v.* Palmer (115 N. Y. 506) on the ground that this husband had not committed the crime with intent to enrich himself. This attempt failed, the court declaring that one shall not be allowed to profit by his own wrongdoing, and holding that the land belonged to the heirs of the wife. (Van Alstyne *v.* Tuffy, 169 N. Y. Supp. 173).

Tenancy by the entirety raises interesting questions in bankruptcy. It was held *in re* Berry (247 Fed. 700) that the trustee in bankruptcy of the husband acquires no interest in lands held by him and his wife as tenants by the entirety. And in Ades *v.* Caplan (132 Md. 66, 103 At. 94) a judgment against the husband and wife jointly was held to be vacated by bankruptcy proceedings begun against the husband in four months.

Lien on Automobiles.—One engaged in selling automobile tires who takes off old tires and puts on new ones without charge for such service and merely as an incident to the sale does not acquire a lien on the auto for the price of the tires under a statute giving a lien to wheelwrights (Weber Implement & Automobile Co. *v.* Pearson — Ark. —, 200 S. W. 273). The same court had previously held an automobile repairer to be within the statute (Shelton *v.* Little Rock Auto Co., 103 Ark. 142), but it declined to treat the taking off of old tires and putting on new ones as a species of repairs, because the work did not require a skilled mechanic. A different ruling was made in Courts *v.* Clark (84 Ore, 179, 164 Pac. 714).

Modifying Corporation Charters.—Ever since the decision of the Dartmouth College Case, it has been settled law in this country that the charter of a corporation is a contract between the grantor and grantee of the charter, and that any attempt of the grantor to change it (unless such an attempt falls within the police power) is ineffective because of the constitutional prohibition upon impairing the obligations of contracts. Even when the grantor has expressly reserved the right to alter, amend or repeal the charter, New Jersey courts hold that the alteration may be unconstitutional if it is not in the nature of a regulation of the corporation's rights and duties and does not promote the public welfare. Hence it was held recently in that state that a statute requiring a railroad company to carry the members of a state commission without charge was unconstitutional (Napier *v.* Delaware, etc., Ry., 91 N. J. L. —, 102 At. 444).

Municipal ordinances and resolutions may be unconstitutional, though the municipal body is not the grantor of the charter. If the authority which it undertakes to exercise is legislative, it acts as an organ of the state as truly as does the state legislature. And if it undertakes to use this authority with a view to modifying the legal rights and duties of the corporation under its charter, as when it attempts to force a railroad corporation to reduce its fares, its ordinance or resolution may be unconstitutional (City of Cincinnati *v.* Cincinnati & Hamilton Traction Co., 245 U. S. 446, 38 Sup. Ct. R. 153; Northern Ohio Traction & Light Co. *v.* State of Ohio, 245 U. S. 574, 38 Sup. Ct. 196).

Damages for Breach of Contract.—A physician who breaks his contract to treat a patient is liable in Mississippi to damages for mental anguish as well as for other loss sustained by the patient from the breach, but is not liable to exemplary damages (Hood *v.* Moffett, 109 Miss. 757, 69

So. 664, Ann. Cas., 1917, E. 410). The fact that the physician's breach of contract was due to his being at the bedside of another patient did not avail him. He should not have contracted to attend the first patient whenever she needed him.

TORTS

Negative Tort.—An innkeeper is not obliged at common law to provide fire escapes. If, however, a statute imposes this duty upon him, his failure to obey it, followed by the injury of a guest who could have escaped harm had the statute been complied with, constitutes an actionable tort (Hooper *v.* Creighton, 100 Neb. 510, 160 N. W. 742). Nor is it important that the statute provides only for criminal liability for its breach.

Tortious Interference with Contract Relation.—An Ohio corporation contracted to furnish special machines to a New Jersey corporation, stipulating for exemption from damages in case it was prevented from performing its contract by strikes. Its workmen struck and by threats and force prevented others from working for it. The New Jersey company had no remedy against the Ohio company for the loss caused by the Ohio company's nonperformance. It was allowed, however, to maintain an action against the wrong-doing strikers (Niles-Bement-Pond Co. *v.* Iron Molders Union, 246 Fed. 851). The decision is novel, but seems to be the logical result of the view that one's interest in a contract is a property right which cannot be injured by the wilful wrongdoing of another without subjecting him to legal liability therefor.

Defamation; Privileged Communications.—From considerations of public policy some persons are allowed to defame others without liability to answer in damages therefor. They are said to enjoy an absolute privilege in libel and slander. The class is small, being practically limited in this county to members of legislative bodies, to the judiciary, and to the heads of executive departments. In many cases defamation is conditionally privileged, that is, the law presumes the defamatory statement to have been made in good faith and for an honest purpose. But if the victim proves that the utterance was made in bad faith and for a malicious purpose, the privilege is forfeited and the defamer is liable to respond in damages. A petition for the revocation of a liquor license made to the proper officers and upon proper occasion is conditionally privileged. If, however, the petitioners do not conform to statutory requirements and falsely charge the licensee with keeping a disorderly place, doing this in an unreasonably violent manner, the communication is not privileged (Koehler *v.* Dubose, — Tex. —, 200 S. W. 238).

That a newspaper cartoon may constitute actionable defamation was decided in Newby *v.* Times-Mirror Co. (173 Cal. 387, 160 P. 233, Ann. Cas., 1917, E. 186). The cartoon in question presented plaintiff "with a sinister expression" in the company of others who were engaged in transactions of a ridiculous, dishonest or disreputable nature, under the heading: "And These are our Leading Reformers." Below the cartoon was printed: "All hypocrites are sinners, but, thank God, all sinners are not hypocrites."

That defamation of third persons by one spouse in conversation with the other is privileged is well settled. Whether the privilege is lost when the statement is overheard by an outsider is a question on which the authorities differ. In Conrad *v.* Roberts (95 Kan. 680, 147 Pac. 795, Ann. Cas., 1917, E. 891, with full note) it was held that the privilege is not lost though the speaker is aware of the presence of outsiders unless he sought to have them present. In this case the wife claimed to have made the statement to her husband for the protection of his interests and those of their family.

Bailments. — A postal employee stole from the mails $15,000. He had given the Government a bond for $2,000 with a guaranty company as surety. The Government's liability to the owner of the stolen property was limited to $50. Nevertheless, it was allowed to recover the full amount of the bond from the surety, on the ground that the bailee of goods has a possessory right which enables him to recover the full value from a wrongful converter (U. S. Fidelity & Guarantee Co. *v.* U. S., 246 Fed. 433). Undoubtedly the Government would be liable to the bailor for the excess above its own interest recovered from the surety.

Res Ipsa Loquitur. — That this phrase is rarely to be applied literally to a particular situation is shown by Di Sandro *v.* Providence Gas Co. (40 R. I. —, 102 At. 617). Plaintiff insisted that he had made out a case against the defendant by proving that an explosion of gas was due to a leak in defendant's gas pipe. The decision supports the view that the phrase *res ipsa loquitur* is merely a short way of saying that the circumstances attendant upon an accident are themselves of such a character as to justify a jury in inferring negligence as the cause of that accident. Nor does the phrase apply to a case where a person alongside a railroad's right of way is injured by suction from a rapidly moving train. Such an injury "is not to be reasonably expected by those operating trains" (Davis *v.* Southern Ry. Co., 170 N. C. 582, 87 S. E. 745, Ann. Cas., 1918, A. 861).

Attractive Nuisances; Baited Victims.—The doctrine that a trespasser is transformed into a baited victim by a landowner who permits turntables, ponds of water or other alluring things upon his property, and, thus metamorphosed, may recover for injuries sustained while under the attraction of the dangerous thing, is subjected to various limitations. In Johnson *v.* Atlas Supply Co., (— Tex. Civ. App. —, 183 S. W. 31) it was ruled that a landowner who "permitted a sweet-tempered little girl to live on its premises" was not within the doctrine of attractive nuisances. A similar reaction against the doctrine is shown in Barnhart *v.* C. M. & St. P. Ry. (89 Wash. 304, 154 Pac. 441). Here a boy of eight was drowned while navigating a raft with other playmates on a pond which had formed within defendants' right of way. His father claimed that the railroad company should have drained the water off, and that by failing to do this, and permitting the pond to beckon the boy to his doom, it became liable for the death. The court said:

> No one will deny that a pond of water is attractive to boys for the purpose of playing, swimming and fishing. But its being an attractive agency is not sufficient to subject the owner thereof to liability. It must be an agency such as is likely to or will probably result in injury to those attracted to it. It is true that many boys lose their lives by drowning. But the number of deaths in comparison to the whole number of boys that visit ponds, lakes, or streams for play, swimming or fishing, is comparatively small, and it would be extending the doctrine too far to hold that a pond of water is an attractive nuisance.

Lawful Businesses as Nuisances.— Undoubtedly a lawful business may be a nuisance in one locality while it is not in another. The ordinary person would not consider a theatre or a bowling alley a nuisance *per se.* Are they nuisances when carried on in a residential neighborhood? According to the Supreme Court of Maryland they are, because they necessarily cause disturbance, to the serious annoyance and physical discomfort of persons of ordinary sensibilities in the neighborhood (Hamilton Corporation *v.* Julian, 132 Md. —, 101 At. 558). Complaint was made while buildings for use as theatre and as bowling alley were in process of erection and an injunction against their completion was granted.

Liability of Inviter to Invitee.—On principle it is submitted that one who is injured by the negligence of another while enjoying the gratuitous hospitality of the other should recover damages from the host only when his negligence is gross. Such is the doctrine followed in a recent well considered Massachusetts decision (Massaletti *v.* Fitzroy, 228 Mass. 487, 118 N. E. 168). It is applied by most courts to the relation of host and guest in homes. When the invitation takes the form of carrier and passenger, some tribunals hold the inviter liable for less than gross negligence. In this class belongs the recent case of Avery *v.* Thompson (117 Me. —, 103 At. 4), where the defendant invited the plaintiff to ride as his guest in an automobile. Through the defendant's negligence while crossing a railroad track, plaintiff was seriously injured. He had warned defendant of the train's approach.

Parent's Liability for Injuries Inflicted by Child.—The relation of parent and child is not that of master and servant, and the parent is not liable for the child's tort unless his own fault is a contributing cause to the injury. In Salisbury *v.* Crudale (— R. I. —, 102 At. 731) the defendant broke the stock of a gun and placed it under his bed in order to conceal it from his children. It was loaded, however. His boy of 13 found it, and while playing with it with plaintiff, shot and injured him. It was held to be a question of fact for the jury whether the defendant had used due care in keeping this dangerous instrument from his child, and if he had not, whether his negligence was a contributing cause of plaintiff's harm. Had the defendant unloaded the gun as well as broken the stock and concealed the fragments, he would have escaped liability.

Proximate Cause.—A railroad company was so negligent in running a train that it collided with a train in front of it. In the collision the brakeman in the forward train was injured. He had neglected his duty of going back with a signal for trains following his. As the Federal Employer's Liability Act abolished the defense of contributory negligence, it was held that he could recover; his intervening negligence, not being an act, but a failure to act, did not affect or deflect the force put in motion by the company's act in negligently running the harm-doing train (Union Pacific Ry. *v.* Hadley, 246 U. S. 330, 38 Sup. Ct. 318).

In another case a railroad company was negligent in a grade-crossing collision with plaintiff's wagon. The contents of the wagon were scattered and later were stolen. It was held that the negligence was the proximate cause, not only of the injury to the wagon, but of the loss of the contents by theft. Such a loss might have been reasonably anticipated as a result of the scattering of the articles. (Brower *v.* N. Y. C. & H. R. Ry., — N. J. L. —, 103 At. 166).

The same court on the same day had to consider proximate causation in an insurance case. Plaintiff held a policy insuring him against "direct loss by burglary." Burglars entered the premises, stole many articles and left various garments strewn about, which were eaten by moths. The loss from moth-eating was held not to be "direct loss by burglary" (Downs *v.* N. J. Fidelity, etc., Co., — N. J. L. —, 103 At. 205). Undoubtedly had the action been against the burglars as trespassers, this loss would have been treated as a proximate result of their wrongdoing. But the construction put upon the contract provision above quoted seems the proper one.

Workmen's Compensation. — Workmen's compensation acts have given rise to divergent decisions of an interesting character. The servant is hired in one state and is injured while serving his employer in another state; in which jurisdiction should he sue? A recent Connecticut case decides that he should bring his action in the state where he is serving at the time of his injury (Banks *v.* Howlitt, 92 Conn. 368, 102 At. 822).

An infant sought to disaffirm his contract of hiring, in order to avoid the application of the Workmen's Compensation Act of New Jersey to his case, and to sue at common law for damages which a jury might assess. He was not allowed to do so, as the statute provided that all contracts of hiring, including those of minors, should be presumed to be made with reference to the Act (Young *v.* Sterling Leather Works, 91 N. J. L. —, 102 At. 396).

Is the helper of the driver of a delivery truck injured in the course of his employment in the following circumstances? His employer provided a safe place for him while riding. He gave up his seat to two working girls on their way home. While he was standing on the running board, the truck hit an obstruction and he was thrown off and killed. The girls were uninjured. The question was answered in the affirmative. It was considered immaterial how he happened to be on the running board, as at the time of the accident he was making the trip under his contract of employment (Siglin *v.* Armour & Co., 261 Pa. 30, 103 At. 991).

A laborer who has lost one eye does not sustain "a total and permanent disability" within the meaning of a statute which defines such disability to consist in the loss of both eyes (Weaver *v.* Maxwell Motor Co., 186 Mich. 588, 152 N. W. 993, Ann. Cas., 1917, E. 238). Whether an injured workman is to receive compensation for disfigurement or only for impairment of earning capacity depends on the terms of the statute (Weber *v.* American Silk Spinning Co., 38 R. I. 309, 95 At. 603, Ann. Cas., 1917, E. 153). This statute limited compensation to the latter. That a night watchman who is hurt by falling from a window while asleep instead of watching did not sustain an injury arising out of and incident to his employment is laid down by the New York Court of Appeals, reversing an order of the state Industrial Commission, in Gifford *v.* Patterson (222 N. Y. 4, 117 N. E. 946). An infant who is engaged in serving another under an illegal agreement cannot maintain a claim for damages under the Workmen's Compensation Act of Wisconsin, as the Act applies only to minors "who are legally permitted to work under the laws of the State" (Stetz *v.* F. Mayer Boot & Shoe Co., 163 Wis. 151, 156 N. W. 971, Ann. Cas., 1918, B. 675, with note).

PRACTICE

Attorney's Interest in Litigation.—An agreement whereby an attorney acquires an interest in the subject matter of the litigation which he is conducting is condemned not only by the Code of Legal Ethics approved by the American Bar Association (Canon 10) but also by the courts (Nichols *v.* Waters, 201 Mich. 27, 167 N. W. 1). In this case the client settled the suit with his adversary without his attorney's consent, although he had agreed with the attorney not to do this. Such agreement was held void as it was avowedly against public policy. The compromise of litigation is deemed commendable, and the court will not sanction agreements whereby the client is compelled to continue a law suit for the pecuniary gain of counsel. Although contingent fees are allowed by statute in many of our states, contracts for them bring discredit on the Bar.

Disbarment of Attorneys.—An attorney has the right to criticize the decision of a court, but when he makes a funeral oration over one executed as a convicted murderer the occasion for a violent attack upon the integrity of a court which affirmed the conviction, charging it with prejudice, unfairness and subserviency to a powerful religious body, he is subject to disbarment for unprofessional conduct (*In re* Hilton, 48 Utah 172, 159 Pac. 691, Ann. Cas., 1918, A. 271). He is disbarred, not as a punishment

> for any slander or defamation of their character, or for any wrong or injury done them as individuals, for their individuality is lost in the majesty of the office, but to preserve and uphold the dignity, respectability and good name of the courts themselves and to protect them and the public from one shown to be unworthy and unfit to be a member of the honorable profession.

Corporations Practicing Law.—It is a criminal act under the New York penal law for a corporation or voluntary association to act as an attorney at law, or to furnish legal services or advice, or to furnish attorneys or counselors to render such services or advice. A trust company advertised that it would furnish advice in the drawing of wills, and it employed attorneys at law to give the advice and draw the wills, who, as a rule, named the company as executor. The company was held to have violated the statute (People *v.* People's Trust Co., 167 N. Y. Supp. 767, 180 App. Div. 494). Another trust company published its rates for drawing bills of sale and chattel mortgages, and engaged in drawing these papers for its customers. This was held to be a violation of the statute (People *v.* Title Guaranty & Trust Co., 168 N. Y. Supp. 278, 180 App. Div. 648). These decisions have been criticized as giving undue breadth to the terms "legal services," and "legal advice," but certainly, if the corporation employs professional lawyers to render these services, it would seem to be estopped from denying that the statutory terms cover its conduct.

Evidence.—An insurance policy issued by the defendant required the insured to "produce evidence that the loss was due to burglary, theft or larceny." Plaintiff established his case by circumstantial evidence that convinced a jury, but defendant insisted it was not liable because plaintiff failed to produce direct evidence. The court (Garner *v.* N. J. Fidelity, etc., Co., 199 Mo. App. —, 200 S. W. 448) refused to hold

> that the term "direct evidence" must be given its strict and severely technical meaning, when used in a policy of burglary insurance. If so, then the policy means that it insures against only such burglaries, thefts, or larcenies as can be established by the evidence of eyewitnesses. But of course, only one out of a thousand or more could be established in that manner, and then only by virtue of some lucky or fortunate accident. To give the policy the construction attempted to be placed upon it by defendant would be to impute an intention to the parties which would render the policy a joke and the taking out of the insurance an absurdity.

Women as Jurors.—Statutes making women eligible as jurors are bringing up new questions for judicial determination. In State *v.* Harris (99 Wash. 475, 169 Pac. 971) the court had to consider whether the separation of the women jurors from the men during the recesses of the trial was a ground for a new trial. The question was answered in the negative, as "the rules of society, propriety and common decency require mixed jurors to separate according to sexes at stated intervals."

Property in News.—News gathering has become an important business enterprise, and the law secures to the gatherer property rights in the news which it is his business to supply for publication. The Associated Press has subscribers throughout the United States for its news. Its patrons print its reports in the eastern sections of the country some hours prior to publication by the patrons in the western section. Does the gatherer lose its right to prevent competitors of its western patrons from having its news telegraphed from the East as soon as the eastern papers are published? The question is answered in the negative in Associated Press *v.* International News Service (245 Fed. 244, modifying 240 Fed. 983). Full protection can be afforded the newsgatherer, said the court, only by preventing the use of the news by rivals for a sufficient time to enable the daily newspapers throughout the country to receive and publish the news. Until then there is no purpose to abandon publication to the public. The judgment was affirmed in the U. S. Supreme Court, Dec. 23, 1918.

Trade Names.—Defendant adopted as the trade name for syrup which it manufactured the trade name long used by plaintiff for its pancake flour. The lower court refused to enjoin defendant's use of the name, on the ground that flour and syrup were not competing goods, that "no one desiring to purchase flour would accept syrup without knowing the difference." The Circuit Court of Appeals, however, considered that the reputation acquired by the plaintiff for the trade name of its pancake flour would naturally induce the public to think that syrup bearing the same name was made by the plaintiff. Hence defendant was not only misleading the public into buying its goods as the goods of the plaintiff, but was taking to itself, without reimbursement to the plaintiff, a trade name whose reputation had been built up by costly advertising by the plaintiff. (Aunt Jemima Mills Co. *v.* Rigney & Co., 247 Fed. 407, 159 C. C A. 461.)

The owner of a trade name who seeks to enjoin its use by another will be defeated if his business is a fraud upon the public. In Howard *v.* Lovett (199 Mich. —, 165 N. W. 634) plaintiff asked an injunction against defendant's appropriation of the name of a vaudeville act. As plaintiff's act purported to exhibit thought transference, when in fact it was a mere trick upon patrons, and as he had published a false autobiography in support of the trick, an injunction was denied. In such cases courts do not commend defendant's conduct. They deny relief to the plaintiff "on the ground that the privilege of deceiving the public is not a legitimate subject of commerce; that one has no legal right to complain that by the fraudulent rivalry of others his own fraudulent profits are diminished."

Publication of Personal Letters.—Letters are deemed the property of the writer, and courts do not hesitate to enjoin their publication by the recipient or third parties when the writer asks for such relief. Accordingly, though a party to a divorce suit puts in evidence letters from the other party showing improper relations with a third person, he will not be allowed to publish them against the objections of the writer (King *v.* King, 25 Wyo. —, 168 Pac. 730). Probably the letters had no monetary value, but the technical property interest of the writer sufficed to supply a ground for granting the injunction, though the real right which was threatened with invasion was the right of personality. There are judicial dicta to support the view that this right ought to be protected by injunction even though there is no property right to serve as a peg on which to hang the application. It is to be confessed, however, that many courts affirm that equity will not grant an injunction to "enforce mere personal rights as distinguished from property rights." In Angelus *v.* Sullivan (246 Fed. 54) plaintiff sought to enjoin a local draft board from certifying him for military service, on the ground that he was an alien. The injunction was refused.

STATUS

Adopted Children. — Adopted children in this country inherit from their adoptive parents, but do not lose all legal relations to their natural families. To what extent adoption modifies these relations depends upon the state statutes on this topic, as the common law makes no provision for adoption. In the case of Brewer *v.* Browning (155 Miss. 358, 76 So. 267) a legally adopted child inherited from her adoptive father considerable property. Dying without a will, her estate was claimed by her natural brothers and sisters and also by her adoptive mother. As the Mississippi statute authorizing adoption contained no provision on this point, the court decided that the property inherited by the child from her adoptive father should go to her adoptive mother rather than to her natural heirs. This was thought to be more consistent with justice and to better harmonize with the statutory policy of encouraging adoption. The Michigan statute provides that the adopted child shall become an heir-at-law of the adopting parent as though a natural child. A legally adopted child, upon a second adoption by others during the life of the first foster father, loses his statutory right of inheritance from him (*In re* Klapp's Estate, 197 Mich. 615, 164 N. W. 381).

Remarriage of Divorced Persons.—Divorced persons give the courts much trouble. A frequently litigated question is whether the remarriage of a divorced person within the period prohibited by statute is void or voidable. This often turns upon the interpretation of a statute, and while judicial decisions are not easily reconcilable, they generally construe the statutes so as to uphold a remarriage that has resulted in the formation of a new family relation (Woodward *v.* Blake, 38 N. D. 38, 164 N. W. 156, L. R. A., 1918, A. 88). The remarriage to a third person of a divorced wife estops her from questioning the validity of the divorce decree and claiming a wife's right in her former husband's estate (Bruguire *v.* Bruguire, 172 Cal. 199, 155 Pac. 988, Ann. Cas., 1917, E. 122).

MISCELLANEOUS

False Statements.—A false but not fraudulent statement of fact is ground for avoiding a release from damages executed by an injured passenger to a railroad company. The false statement was made by a physician employed by the company, and was relied on by the passenger when he gave his release. He was allowed to rescind the settlement and to recover damages awarded by a jury. (Jacobson *v.* C. M. & St. P. Ry. Co., 132 Minn. 181, 156 N. W. 251, Ann. Cas., 1918, A. 355.)

Annulment of Will During Testator's Life.—This was attempted in Pond *v.* Faust (90 Wash. 117, 155 Pac. 776, Ann. Cas., 1918, A. 736) but without success. The testatrix had been adjudged insane, and her guardian sought to have the will annulled on the ground that the testatrix was insane when she made the will. The trial court found that she was insane and ordered the will cancelled. This decision was reversed on appeal by the Washington Supreme Court, which declared that as a will speaks as of the date of the testator's death, it is, until that event occurs, subject to the will of the testator and to the will of the state; that until one dies he has no heirs and there is no one to whom his estate can pass, and hence there are no persons representing conflicting interests between whom a legal controversy can be judicially instituted respecting the will. The attempt was admittedly novel.

Conflict of Laws.—Union Trust Co. *v.* Grosman (245 U. S. 412, 38 Sup. Ct. 147) is an interesting example of questions in the conflict of laws which are constantly arising in this country, where the states are, for many purposes, foreign jurisdictions. The defendant, a married woman domiciled in Texas, executed in Chicago a guaranty of a note made by her husband and another. By the law of Texas such a contract by a married woman is void, but it is valid by the law of Illinois. She was sued in the Federal court in Texas and pleaded the invalidity of her contract. The decision of the District Court was against her, but the Circuit Court of Appeals and the Supreme Court were in her favor, holding that the law of Texas governed the case. Had the suit been brought in Illinois the Supreme Court intimated that

> it would present broader issues. On the one side would be decisions that *locus regit actum* and the consideration that when a woman goes through the form of contracting in an independent state, theoretically that state has the present power to hold her to performance, whatever may be the law of her domicile. It might be urged that the contract should be given elsewhere the effect that the law of the place of making might have insured by physical force.

Liability of Inactive Directors.—The defendant claimed exemption from liability to stockholders for the mismanagement of the company's affairs by its president, on the ground that his election as director was conditioned upon his not attending meetings or taking an active part in the management of the company. Such an arrangement was held not to be a bar to recovery. It is a question of fact whether these losses, consequent upon the mismanagement, are attributable to his failure to perform the duties imposed upon him by statute. The court did not hold that his inattention to his duties rendered him liable as a matter of law (Kavanaugh *v.* Commercial Trust Co. and Gould, 223 N. Y. 103, 119 N. E. 237).

CRIMINAL LAW

Federal Legislation.—Congressional legislation has added but little during the year to the volume of criminal law. Chapter 143 provides additional safeguards for the health and morals of the Army and Navy cantonments. Chapter 138 makes it a misdemeanor to wear with intent to deceive and without authority any naval, military, police, or other official uniform, decoration or regalia of any foreign state with which the United States is at peace. Evidence of the importance attaching to the registration of vessels at the present time, is afforded by the additions to the Revised Statutes of Sections 8146r, 4 and 5, providing for the punishment of knowingly false statements of fact made to the Shipping Board upon registration. Chapter 111 adds Section 9989j to the Revised Statutes, making the use of water from Niagara Falls without permit from the Secretary of War a misdemeanor.

State Legislation.—As but 11 states held regular legislative sessions this year, the number of statutes dealing with crimes is comparatively small. Perhaps the minimum is found in Wisconsin, where the only act of importance is Chapter 13, providing punishment for seditious conduct. Massachusetts found occasion to add but one criminal offense to its list. By Chapter 41 the challenge of a qualified voter for purposes of intimidation or of ascertaining how he voted or for any other illegal purpose is punishable by a maximum fine of $100.

South Dakota added an important chapter to its criminal law (Ch. 38), defining and providing for the punishment of criminal syndicalism. It is defined as "any doctrine or practice which teaches, practices or advises crime, sabotage (sabotage means wilful and malicious damage or injury to the property of another), violence or other methods of terrorism, or the destruction of life or property for the accomplishment of social, economic or political ends." The crime is punishable by imprisonment of from one to 25 years and a fine of from $1,000 to $10,000.

In several states criminal legislation was evoked by war conditions. To this class belong Chapter 476 in Maryland, making the false personation of a military officer a crime; Chapter 36 in New Jersey punishing those who oppose enlistments of soldiers, Chapter 44, as to inciting insurrection or sedition, and Chapter 97, making it a misdemeanor for one not a citizen of the United States to act as a detective; Chapter 625 in New York and Chapter 1661 in Rhode Island, known as the anti-loafing laws (see XV, *Labor Legislation*); Chapter 246 in New York, as to seditious textbooks; Chapter 264 in New York, and Chapters 12 and 16 in Texas, protecting the morals of soldiers and sailors.

Fraudulent practices of various kinds are made criminally punishable by Chapter 85 in Maryland, which deals with graft given to or taken by chauffeurs in contracts relating to motor-car repairs or supplies, and Chapter 297, covering fraudulent failure to pay hotel or boarding-house bills; Chapter 1656 in Rhode Island, relating to fraudulent failure by buyers of milk for shipment to pay for it; Chapter 469 in South Carolina, making it a misdemeanor for one fraudulently or with malicious intent to refuse to perform a contract to serve or to employ; Chapter 271 in Virginia, to punish false statements to obtain property or credit, and Chapter 261, providing severe punishment for those violating the right of owners of bottles, siphons, siphon heads, tins, kegs, crates and boxes used in connection with beverages, ice cream, etc. (*cf.* a similar statute in South Carolina, No. 494, and Chapter 78 in Texas).

Juvenile delinquents, the feebleminded children of criminal mothers, and family desertion are the topics of Chapter 86 in New Jersey, Chapter 54, Sec. 32, in Kentucky, and Chapters 276 and 416 in Virginia. The last-named statute is substantially the Uniform Family Desertion Act.

The crime of larceny has been greatly extended, in Maryland by Chapter 422, which makes one guilty of the crime who unlawfully takes an animal or vehicle for present use, though not with intent of appropriating or converting the same; and in New York by Chapter 314, adding Sec. 1292a to the Penal Code, which declares that any person who, with intent to defraud, issues a check, draft or order for money upon a bank knowing that there are not sufficient funds to meet the same, is guilty of attempted larceny, and if money or property is obtained thereby, is guilty of larceny. The refusal of payment for lack of funds is *prima facie* evidence of intent to defraud and of knowledge of insufficient funds unless the drawer pay the amount of the check or order, with interest and protest fees, within 10 days after notice of non-payment.

Kentucky leads in the volume of criminal legislation for the year, with Rhode Island and South Carolina ranking second and third. Kentucky punishes a tax commissioner who fails to qualify, with a fine of $500, and adds drastic statutes for the suppression of diseases among bees (Ch. 92) and live stock (Ch. 69), and for the abatement of houses of illfame (Ch. 61). The last-named act makes general reputation of the place admissible as evidence of the existence of this form of nuisance. This state also makes it the duty of trainmen to prosecute persons drinking intoxicating liquors on railroad cars. Rhode Island has an elaborate code governing the sale and distribution of narcotic drugs (Ch. 1673). South Carolina finds it necessary to punish as criminals physicians or surgeons who practice "while under the influence of whiskey or drugs." It requires gypsies to pay a license of $300 for living as nomads or be subject to fine and imprisonment.

Texas regulates the business of junk dealing stringently, because "unscrupulous junk dealers are making thieves out of small boys by encouraging them to steal and furnishing a market for their stolen goods." Would that every statute might thus plainly declare the reason for its enactment.

Judicial Decisions.—There are no common-law offenses against the United States. Before a man can be punished as a criminal under the Federal law his case must be plainly and unmistakably within the provisions of some Federal statute, (Hamburg-American Co. *v.* U. S., 250 Fed. 747, 756, following U. S. *v.* Gradwell, 243 U. S. 476, 37 Sup. Ct. 407, 61 L. Ed. 857). Nor are there any but statutory crimes in Louisiana (State *v.* Robinson, 143 La. —, 78 So. 933).

The military authorities of the United States have superior jurisdiction over a soldier who in time of war kills a civilian within a state (*Ex parte* King, 246 Fed. 868). This superior right is not waived by a subordinate military officer's surrender of the criminal to the state authorities.

A member of the U. S. Naval Reserve force driving a motor car with military supplies in accordance with the orders of a military superior is not amenable to the state law as to speed (State *v.* Burton, — R. I. —, 103 At. 962). In such a case the state has subordinated its sovereignty to that of the nation. This doctrine does not apply where no military necessity can be urged. Hence, a mail carrier is subject to state laws regulating the use of highways (Commonwealth *v.* Closson, 229 Mass. 329, 118 N. E. 653). This case also affirms the view that in prosecutions for misdemeanors created by statute under the exercise of the police power, proof of a guilty mind or corrupt purpose is unnecessary.

A civilian cook on a vessel transporting supplies is "serving with the armies in the field", and therefore is liable to be court-martialled for attempting to desert (*Ex parte* Falls, 251 Fed. 415). He is not entitled under the Fifth Amendment to "a presentment or indictment of a grand jury."

The doctrine already referred to, that in a Federal court the alleged offence must be plainly and unmistakably within the statute, was applied in a group of cases under the title of U. S. *v.* Bathgate (246 U. S. 220, 38 Sup. Ct. 269). Defendants were charged with violating Section 19 of the Criminal Code by conspiring to injure candidates for presidential electors and for the offices of U. S. Senator and Representative in Congress. As this section makes criminal a conspiracy to injure, oppress, threaten or intimidate any citizen in the free exercise or enjoyment of a right or privilege secured to him by Federal law, the court held that it had no application to a conspiracy to bribe voters. The right or privilege "guarded by the statute is a definite, personal one, capable of enforcement by a court, not the political, non-judicable one common to all, that the public shall be protected against harmful acts."

The right of a Federal judge to express his opinion on facts established by the evidence and to advise the jury regarding its conclusions thereon is affirmed in Shea *v.* U. S. (251 Fed. 440) and Beyer *v.* U. S. (*ibid.* 39). He does not invade the province of the jury by so doing provided he gives the jury to clearly understand that it is not bound by his opinion or advice. He is not, as he is under some state laws, a mere umpire of the proceedings.

The Selective Draft.—The Selective Draft Act was violently assailed, but its constitutionality was upheld in the Selective Draft Cases (Arver *v.* U. S. and others, 245 U. S. 366, 38 Sup. Ct. 159). Since that decision it is no longer open to question that compulsory military service is not repugnant to a free government nor to the constitutional guaranties of individual liberty. On the other hand it is the duty of the citizen to render military service in case of need, and if he refuses to perform that duty when duly summoned thereto, he is punishable as a criminal. The opinion of Chief Justice White contains a full discussion of the topic.

The citizen is not exempted from this duty because his political or social views deny the existence of such duty (Breitmayer *v.* U. S., 249 Fed. 929). If he disregards the call to service he becomes a deserter and subject to military law and discipline. He cannot defeat the sentence of a court-martial by pleading the pendency of a criminal prosecution in a civil court, but is an offender under both the criminal and the military law (*Ex parte* Dunn, 250 Fed. 871). It is also a crime to solicit others not to register under this Act, though the solicitation is ineffective (U. S. *v.* Galleanni, 245 Fed. 977).

The validity has been sustained of that part of the Act which confers upon the Secretary of War power to suppress and prevent houses of ill-fame, within such distance as he may deem needful of any military camp (U. S. *v.* Scott, 248 Fed. 361; Pappens *v.* U. S. 252 Fed. 515) and which gives to the President authority to make rules for its enforcement (Franke *v.* Murray, 248 Fed. 865).

Criminal prosecutions under the Act have involved collateral questions of interest. In Goldman *v.* U. S. (245 U. S. 474, 38 Sup. Ct. 166) and Kramer *v.* U. S. (245 U. S. 478, 38 Sup. Ct. 168) it was held that under Section 37 of the Criminal Code an unlawful conspiracy to bring about an illegal act and the doing of overt acts in furtherance of such conspiracy is of itself inherently and substantially a crime, whether the conspiracy has resulted in accomplishing its illegal end or not. In Ruthenberg *v.* U. S. (245 U. S. 480, 38 Sup. Ct. 168) the appellants contended that their constitutional rights were invaded because none of the grand and petit jurors was a socialist but all were members of other political parties and property owners. This doctrine was denied on the strength of adverse rulings in cases of negro defendants, such as Thomas *v.* Texas (212 U. S. 278, 282, 29 Sup. Ct. 393, 53 L. Ed. 512).

Sedition and Espionage.—The Espionage Act (40 Stat. 219, Ch. 30) has been applied by the lower Federal courts in various cases, the decisions in many of which have not yet appeared in the official reports (see list in 252 Fed. 220). The prevailing view is expressed in U. S. *v.* Hall (248 Fed. 150, 153) as follows:

> The Espionage Act is not intended to suppress criticism or denunciation, truth or slander, oratory or gossip, argument or loose talk, but only false facts, wilfully put forward as true, and broadly with the specific intent to interfere with army or navy operations. . . . Congress has not denounced as crimes any merely disloyal utterances, nor any slander or libel of the President or any other officer of the U. S. . . . In the main the Government's attorneys are of good judgment and will not be coerced by criticism and complaints to futile prosecutions or persecutions.

A verdict of acquittal was directed in this case. The indictment was held insufficient in U. S. *v.* Schutte (252 Fed. 212) because it did not allege that "the language was uttered under circumstances tending to interfere with success of military operations." Indictments under the Act were sustained in U. S. *v.* Schaeffer (248 Fed. 290); U. S. *v.* Prieth (251 Fed. 946); U. S. *v.* Nagler (252 Fed. 217); U. S. *v.* Nearing (252 Fed. 223).

IX. PUBLIC RESOURCES AND PUBLIC WORKS

PUBLIC LANDS

MORRIS BIEN

Legislation.—The exigencies of the war in Europe have naturally resulted in less attention to land matters than usual, so that but a small amount of legislation on this subject has been passed during the year. An Act of Congress of Dec. 20, 1917, provided for conditions which had arisen in consequence of the war by permitting the absence of entrymen from homesteads for the purpose of meeting the shortage in farm labor. There had been so much difficulty in securing the necessary laborers for farm work that Congress took this means of releasing a considerable number of men who could spare much of their time from their own farms and utilize it in working on the farms of others. Such absence under the existing law would invalidate their entries, and Congress therefore provided that during the period of the war, any homestead settler or entryman should be entitled to leave of absence from his land for the purpose of performing farm labor, and that such absence while actually engaged in farm labor should upon compliance with the terms of the Act be counted as constructive residence. The requirements are that the settler shall give notice of his intention to be absent and show when and where he was engaged in farm labor during such absence. He is not excused from making the improvements or performing the cultivation required by law.

The necessary absence of entrymen from their homesteads on account of service in the Army or Navy created a situation in regard to their various obligations to the Government that Congress was obliged to meet by legislation. The Soldiers' and Sailors' Civil Relief Act of March 3, 1918, covers a number of important subjects in this connection. Sections 500 and 501 refer to the matter of taxes on real property owned in general for dwelling or business purposes by a person in military service or his dependents. Section 500 excuses the payment of taxes or assessments; such tax or assessment will bear interest at the rate of six per cent. per annum, but there shall be no other penalty for failure to pay. This immunity lasts no longer than six months after the termination of the war. Section 501 relates to the public lands, and in a similar manner the requirements for all payments and obligations are suspended until six months after the end of the war.

General Regulations.—During the year there were issued by the General Land Office and the Secretary of the Interior two important announcements of regulations relating to the public lands. On March 6 the Secretary of the Interior approved regulations under the Act of Aug. 11, 1916, which provides for the taxation of public lands by state irrigation districts when such public lands are included within the area to be irrigated from the system operated by the irrigation district (*A. Y. B.*, 1916, p. 273). On March 21 the Secretary approved regulations concerning the use of public lands for exploration and the disposition of potash deposits under the Act of Oct. 2, 1917 (*A. Y. B.*, 1917, p. 253).

In September President Wilson created the Katmai National Monument, Alaska, enclosing the volcano of Mt. Katmai and several neighboring valleys of steaming vents, including the "Valley of Ten Thousand Smokes."

Status of Public Lands.—The following table shows the condition of the public lands on July 1, 1918, giving for each state the total area of land unappropriated and unreserved and the area surveyed:

	Area, acres	
	Surveyed	Total
Alabama	35,220	35,220
Arizona	6,829,800	21,256,010
Arkansas	281,436	288,476
California	15,900,150	20,529,034
Colorado	8,441,461	10,271,955
Florida	114,726	114,726
Idaho	8,167,725	13,322,716
Kansas	5,275	5,275
Louisiana	33,649	45,559
Michigan	72,829	72,829
Minnesota	469,973	469,973
Mississippi	42,064	42,064
Missouri	147	147
Montana	3,335,963	8,201,019
Nebraska	105,909	108,556
Nevada	31,848,173	55,082,200
New Mexico	13,692,216	19,115,554
North Dakota	116,138	116,138
Oklahoma	1,715	31,715
Oregon	13,369,819	14,325,591
South Dakota	793,040	837,226
Utah	14,010,343	31,475,919
Washington	931,872	1,259,983
Wisconsin	6,146	6,146
Wyoming	23,595,511	25,434,194
Total	142,231,300	222,448,225

The unappropriated lands in Alaska are not included. The total area of Alaska is 378,165,760 acres, of which about 23,884,000 acres are reserved. Approximately 1,006,762 acres have been surveyed under the rectangular system.

Disposition of Public Lands.—The total area of public and Indian lands originally entered and allowed during the fiscal year ending June 30, 1918, was 9,974,331.61 acres, a decrease of 6,227,462.77 acres as compared with the area entered during the fiscal year 1917. The area patented during the fiscal year ending June 30, 1918, was 9,552,482.217 acres, a decrease of 1,760,880.023 acres as compared with the fiscal year 1917. Of the above area, 6,492,797.816 acres were patented under the homestead laws, a decrease of 1,051,257.454 acres, not including as homesteads 20,906.54 acres patented as soldiers' additional entries.

The total cash receipts from the sale of public lands, including fees and commissions and sales of Government property, for the fiscal year 1918 were $3,420,783.64, as compared with $3,632,192.89 in 1917, a decrease of $211,409.25. The total receipts from the sales of Indian lands were $1,935,773.73, as compared with $2,445,582.52 in 1917. Other receipts aggregated $75,270.29. Total receipts on account of the operations of the General Land Office during the fiscal year 1918 were $5,431,827.66, a decrease of $717,802.88 over 1917 ($6,149,630.54).

MINERAL RESOURCES

U. S. GEOLOGICAL SURVEY

George Otis Smith

Geological Investigations. — The United States Geological Survey has bent all its efforts during the year toward helping to win the war, routine work having been practically suspended. The increase in the Geological Survey's representation in the Army and Navy from 61 men at the beginning of the fiscal year 1918 to 322 men at the end of the fiscal year (462 on Nov. 11, 1918), necessarily involved a serious reduction in the man power available for the other Survey contributions to war work. In geologic work the specialist have coöperated in every serviceable way with branches of the military departments and war boards of the Government. Special efforts have been made to discover areas likely to yield oil and gas; field studies have been made of deposits of "war minerals," such as manganese, chromite, tungsten, molybdenum, platinum, quicksilver, graphite, mica, sulphur, pyrite, potash and nitrate, in the United States, and field estimates have been made of the available resources of such minerals; and deposits containing steel-hardening metals (manganese, chromite, tungsten and molybdenum) have been examined at 1,580 localities in 23 states and in Central and South America and the West Indies. Studies have been made in the field and in the Survey's laboratory of domestic mica available for commercial use, in order to increase the domestic production of this mineral, used in wireless apparatus, airplanes, and motor trucks. (See also *State Geological Surveys, infra.*)

In Alaska much of the time of the geologists has been devoted to the study of special problems relating to the occurrence of mineral deposits. Deposits of ores of tungsten, tin, nickel and platinum, all rare in the United States, were examined, and some were found to offer fair promise of becoming commercially productive. An all-the-year office has been established at Anchorage, Alaska, where a resident geologist is at all times available for consultation with miners and for coöperation with the Alaskan Engineering Commission, which is constructing and operating the Alaskan railways (see also VII, *Alaska*).

Special Statistical Services.—The Geological Survey has been the chief source of information for the Government war boards and other agencies on mineral statistics of the United States. Figures on production of certain war minerals have been gathered and compiled quarterly, monthly, weekly, and for coal even daily. Producers have been informed and encouraged, and buyers of mineral products have been put in touch with producers.

The Geological Survey took the initiative in organizing a joint information board, representing 36 Government bureaus and divisions, to furnish replies to interbureau inquiries concerning mineral deposits. Connected with both the field examinations and the statistical work is the preparation of special reports for the Capital Issues Committee. These reports cover both mineral properties and power and water systems seeking authority for new development or enlargement, and most of them have embodied data collected in former years in the course of the regular investigations made by the Survey's geologic and hydrologic engineers. Still another natural extension of these investigations of natural resources has been the study of the mineral and power resources of the world, in response to the growing recognition of the fact that it is not sufficient to know simply what America possesses.

Topographical Surveys. — In topographic-engineering work, new topographic surveys of 20,723 sq. miles and resurveys of 408 sq. miles were made (see also *State Geological Surveys, infra*). The work done included 24 new military maps, several maps showing camps, cantonments, and aviation and balloon fields, 24 maps of motor-truck routes, and 25 maps of airplane routes. The Survey continued its work on an aerial panoramic camera, and, in coöperation with Army engineers, made aerial photographic surveys and prepared for publication maps made from aerial photographs, besides training officers and men in this new line of military mapping.

Water Resources. — In water-resources work, special hydrologic field investigations and office studies were made and manuscript reports prepared for the bureaus and boards engaged in the conduct of the war. Problems in regard to water supplies for military and naval establishments in different parts of the country were studied, and reports made to the War and Navy Departments on ground-water supplies at about 50 localities. Surveys were made of desert regions in southern California and southwestern Arizona embracing 60,000 sq. miles, throughout which 635 permanent signs directing travelers to water were erected. Stream gauging was continued at 1,182 stations in the United States and Hawaii, and investigations of ground water were made in 19 states. A Division of Power Resources and a Division of Enlarged and Stock-Raising Homesteads were organized. A comprehensive power survey of the country, work that includes both statistics and engineering, was well begun, to the end that water power may be substituted for power generated by coal at all places where substitution is possible, or that coal may be saved by interconnecting electrical plants or systems. Field investigations of lands applied for under the enlarged-homestead and stock-raising homestead laws were made by the survey in 11 states.

Land Classification.—In land-classification work, public lands aggregating 9,972,256 acres were classified as coal lands, and recommendations were made for the withdrawal from entry of 9,369 acres of coal land and the restoration to entry of 1,105,622 acres. Probable oil lands amounting to 171,247 acres were reported for withdrawal. Indian lands aggregating 42,097 acres were classified as oil lands. Probable phosphate lands amounting to 248,030 acres were reported for withdrawal. Lands aggregating 5,161,080 acres were designated as non-irrigable under the Enlarged-Homestead Acts (*A. Y. B.*, 1915, p. 279). On July 1, 280,349,850 acres stood classified as non-irrigable. Under the Stock-Raising Homestead Act (*A. Y. B.*, 1917, p. 252) 7,538,962 acres of land were designated and final action has been taken on nearly 15,000 out of 49,000 applications for stock-raising homesteads. Recommendations were made for the withdrawal of lands believed to be available for use as power sites aggregating 137,505 acres. Lands amounting to 4,756 acres were reported for withdrawal as public water reserves. Considerable areas of lands previously withdrawn under these several classes were reported for restoration to entry.

Publications.—During the year the Geological Survey's lithographic plant has been occupied much of the time on work for bureaus, boards, offices and other branches of the Government that were engaged directly in the prosecution of the war. The work done has included special new topographic military maps, maps showing camps, cantonments, and aviation fields, maps showing motor-truck routes, maps showing airplane routes, maps of Belgium and of parts of France, sheets showing conventional signs used on French and British maps, British Admiralty charts, hydrographic charts, and numerous other maps, charts, diagrams and illustrations, including colored camouflage charts for the Navy, and recruiting posters. In all 3,372,430 copies of maps, charts, etc., were printed during the fiscal year 1918.

The Survey published during the fiscal year 304 maps of areas in the United States, in editions aggregating 703,338 copies. Of its regular series of publications, it issued 163 reports, aggregating 14,277 pages. During the year it distributed 576,655 books and 530,706 maps.

STATE GEOLOGICAL SURVEYS

William O. Hotchkiss

Activities and Resources.—Thirty-eight states maintained geological surveys during 1918. Curtailment of funds, however, caused embarrassment in Arkansas, New Mexico, South Carolina and Wyoming. The work of the Nebraska Geological Survey is conducted in connection with the Department of Geology in the University of Nebraska and without additional cost to the state. G. M. Butler was appointed director of the Arizona Bureau of Mines to succeed F. W. Willis. E. B. Mathews succeeded Wm. B. Clark (deceased) as state geologist of Maryland. In accordance with an act of the legislature, Kentucky combined its Departments of Geology and Forestry under one head; J. B. Hoeing, who was previously director of the Geological Survey, resigned, and J. E. Barton was appointed commissioner of geology and forestry. The chief function of the surveys continues to be the collection and dissemination of information with reference to mineral resources and geological structure, but many also have charge of road building, forestration, water-power development, soil improvement, and natural-history study. During 1918 the state surveys had over $650,000 available for their work. In addition to this amount $76,250 was applied by other state and Federal bureaus working in coöperation. About 146 scientists were employed during the year, with 37 others furnished by coöperating bureaus, together with a large force of topographers and soil experts who were engaged in making coöperative maps.

Special Activities Relating to the War.—The state surveys since the beginning of the war have shown their desire to coöperate in every way possible with the Government, and have endeavored to meet all demands upon them so far as time and funds were available. In many instances the needs of the Government were anticipated and materials were made subjects of study and research before the actual requests came from the Government. Special investigations of available road materials and underground water supplies were made for the War Department by practically all the Atlantic and Gulf states. The road-material surveys in many states were made in coöperation with the state highway departments.

Because of the constantly increasing need for large quantities of oil and gas, search for new deposits was continued in Arkansas, California, Colorado, Illinois, Missouri, Kansas, Oklahoma, Pennsylvania, Wyoming, Texas and South Dakota. Pyrite, used in the manufacture of sulphuric acid, was investigated in New York, Colorado, Georgia, Missouri, Indiana, Ohio, Alabama, Pennsylvania, Tennessee, Wisconsin, Iowa and Virginia. Manganese ores, required in the manufacture of steel, were the subject of careful and extensive investigation in Alabama, California, Colorado, Georgia, Minnesota, Missouri, Oklahoma, Oregon, Pennsylvania, Tennessee, Virginia and Wyoming. Analyses of potash deposits were made in Colorado and important plants were developed in Nebraska. Work was continued on the examination of road materials in Connecticut, Nebraska, Texas and Wisconsin. Clay investigations were carried on in Alabama, Illinois, Iowa, Missouri, Nebraska, North Carolina, Ohio, Pennsylvania and Tennessee. Steel being of great importance at the present time, materials which are used in its manufacture or as alloys were the subject of special study: uranium and vanadium in Colorado; chrome in California, Wyoming and Oregon; and molybdenum in Colorado and New York. Platinum resources of Colorado and California were investigated, with a view to increasing the present production. Fluorspar deposits were examined in Illinois and Colorado. Deposits of mica which might be suitable for insulation in electrical apparatus and machinery were investigated in Alabama and Colorado. Arizona assisted the Government in a search for porous basalt. New York continued its investigation of sand which might be suitable for industrial purposes or for optical glass. Other investigations carried on were of flints in Indiana and Nebraska, cherts in Indiana, pumicite in Nebraska, and emery in Virginia. California made a report to the Shipping Board on the volcanic tuffs and similar material of that state which might be available for use in the manufacture of concrete for ships.

Topographic Maps. — Topographic maps were completed in coöperation with the U. S. Geological Survey as follows: 20,000 sq. miles in Nebraska; 200 sq. miles in Illinois; 2,265 sq. miles in Texas; and approximately 1,500 sq. miles in Virginia. New Jersey revised some old maps. Five special county maps are ready for the printer in Nebraska. In North Dakota field work was done in the Ray Quadrangle and the Altamont Moraine was mapped in detail. In Texas a reconnaissance topographic map of Terrell County was made. In Virginia the map of Buchanan County was completed and maps of the coal-bearing portion of Tazewell County and of southwest Virginia and the Coastal Plain province are in preparation. McDonough and Randolph Counties in Illinois were mapped.

Economic Geology.—The expenditure of state funds for geological surveys continued to be directed chiefly to the discovery and development of materials of commercial value. Many theoretical and educational studies were made in connection with this main activity. Practically all states coöperated with the U. S. Geological Survey in publishing mineral statistics for the year. Other economic investigations of the year are summarized in the following paragraphs.

Minerals and Stones for the Arts and for Building Purposes.—When this country was cut off from its source of supply of clays (England and Germany), it was necessary to investigate and to develop our own resources. Arkansas, Florida, Georgia, Illinois, Kentucky, Maryland, Mississippi, Missouri, North Carolina, South Carolina, South Dakota, Tennessee, Virginia and West Virginia all have clays that are more or less valuable. The majority of these states are continuing their investigations. Working in coöperation with the Bureau of Mines, the Oregon Survey collected information about manganese and cinnabar ores. New York made a careful search for glass materials. Sand and gravel deposits were located in New Jersey. Manganese was the object of investigation in Colorado, Tennessee and Missouri, and in Minnesota work was done on foundry sands. A report on the tin deposits near Irish Creek was published by Virginia. Limestone deposits were examined in North Carolina. Feldspar and quartz were studied in Maryland. In Nebraska sand, gravel, flint, diatomite, cement and rock were investigated.

Coal and Peat.—In Illinois a special study was made of the utilization of Illinois coal, and incidentally of Indiana and western Kentucky coal, as a substitute for eastern gas coal. Extensive experiments are being carried on along this line. Maryland made a resurvey of its coal fields with reference to the equipment of mines. Missouri has published a report on cannel coal. Virginia completed a report on the coal resources of Buchanan County. Considerable interest was manifested in the study of coal substitutes.

Oil and Gas.—In Wyoming several new oil fields were discovered, all of which were of high gasolene content. Oklahoma did considerable field work concerning oil and gas. Kansas prepared a bulletin of the oil and gas resources of Butler County, also one of the state as a whole. Reconnaissance work has been done in western and northwestern Missouri as to the potential oil and gas territory. Pennsylvania has made investigations of shale-oil possibilities. The Petroleum Division of the California Survey has continued its work relative to drilling of oil wells and conservation of oil and gas. Arizona published bulletins on "Drilling for Oil" and "Laws Pertaining to Oil." Field examinations and reports were made by private parties in Arkansas of territories which were thought to be favorable for oil or gas. In Colorado oil shales were tested and a preliminary report on oil possibilities in eastern Colorado was published. In Illinois 250 sq. miles in Pike County were surveyed, and in Clark County an area containing several thousand wells was studied to see if any promising territory had been overlooked. Texas made a report on the geological conditions near Bridgeport and Chico, with special reference to the occurrence of oil.

Iron, Lead and Zinc.—In Illinois the report on Hardin County, which includes fluorspar, lead and zinc, was completed. Considerable field work in lead and zinc was done in Oklahoma. In Wisconsin a detailed magnetic survey, which has been in progress for six years, was continued and 13 townships in Clark and Wood Counties were surveyed. Owing to the war conditions drilling is at present suspended. Work on the Wisconsin end of the Gogebic iron range has been continued and a report is in preparation. In Minnesota the Survey coöperated with the Bureau of Mines in their work on the geology and concentration of the manganiferous iron ores of the Cuyuna range. A report on the magnetites of the east Mesabi range was also published.

Detailed Areal Surveys.—Surveys of large areas were in progress in many states. Many of these surveys are general in nature and include information on all geologic aspects and the useful mineral resources. Colorado made surveys in Platora-Summitville area (Rio Grande and Conejos Counties), the Carnotite area of southwest Colorado, Twin Lakes area (Lake County), and the Ward district (Boulder County). Maryland made a detailed survey of 500 sq. miles. Ohio has completed a bulletin on Muskigum County which gives especial attention to economic resources. In Oklahoma McCurtain County was surveyed, as well as other areas of small extent in various parts of the state. Texas published reports on the geology of the Glass Mountains, exploration of southeast front range of Trans Pecos, and the geology of Val Verde County, and has in preparation a report on Taylor, Runnells, Dallas, and Terrell Counties. The surveys of Barbour, Upshur, western Randolph, Webster, and Nicholas Counties have been finished in Virginia.

Stratigraphic and Paleontologic Geology.—The reports on the detailed areal surveys mentioned above all include more or less stratigraphic and paleontologic studies. In addition to these, however, several strictly stratigraphic and paleontological reports were published. Alabama made a collection of Tertiary fossils and incidentally a study of Tertiary geology. Colorado made a report on the Cretaceous formations of northern Colorado. Illinois continued its stratigraphic studies of the Mississippian in southern Illinois and the publication of a report is contemplated after the war. Work is being prosecuted on the history of Pleistocene system as revealed by the drift in Iowa. Iowa has also completed a report on the Mississippian system of the upper Mississippi valley and has started work on the stratigraphy and paleontology of the Devonian system. Maryland continued its research on the stratigraphy and paleobotany of the Carboniferous. Michigan continued its investigation of the Pre-Cambrian, Niagaran, and the Mississippian; a monograph on the Marshall Sandstone is in preparation. The Devonian beds in central Missouri were mapped by the Missouri Survey. In Nebraska considerable progress has been made in collecting vertebrate and invertebrate fossils throughout the state, and a paper, "The Fossil and Living Diatoms of Nebraska," is ready for the press. In Wisconsin the stratigraphic work was continued. Other publications of interest on stratigraphic and paleontological subjects are: "Ordovician Rocks of Southwest Ohio," by the Ohio Survey; "Stratigraphic, Paleontological and Historical Geology of a Section of the Colorado River in Runnells and Coleman Counties" and "Permocarboniferous Cephalopods from Western Texas," by the Texas Survey; and "Invertebrate Fossils of the Conemaugh and Pottsville Formations" by the Virginia Survey.

Miscellaneous Maps and Investigations.—Since many of the draftsmen and scientists left the employ of the state surveys for military or Federal service, the work was necessarily very much hampered; however, in spite of these conditions, much important work was accomplished, especially in connection with war work. Connecticut furnished a map for military and engineering purposes showing the character and location of road materials. Field work was done in Clay County, Ala., with a view to the preparation of a geological map of that county. Mapping was begun for the report on the geology of Boone County, Mo. Colorado made extensive investigations of molybdenum, manganese and fluorspar deposits. In the states where there are large military camps the land about those camps was made the subject of special investigation, such as King's Quadrangle near Camp Grant, Ill.; the region about Camp Dodge, Iowa; the geography of Camp Funston, Tex. (by the Kansas Survey) and the country about Camp Lee, Va. (see also XXII, *Physical Geography*). Oklahoma is working on a map of a strip of land covering the 20 miles extending from Oklahoma City to Fort Sill and south to Wichita Falls, Tex. While the primary purpose of this map is to show the aviation fields, it is also an excellent road guide for motorists. South Dakota published reports on the geology and geography of that state, also a paper on the birds of South Dakota. Vermont continued its work on the general geological survey of the state. Working in coöperation with the U. S. Department of Agriculture, the Wisconsin Survey is making an investigation of the vertebrates of that state. Field work in Texas resulted in the publication of several reports, among which was one entitled "The Geology of Camp Bowie and Vicinity." Working with the Virginia Survey, North Carolina completed the investigations of the Virgilina copper district. Besides this report the Survey published "Birds of North Carolina" and "Altitudes of North Carolina." Investigations in Virginia led to the publication of the following bulletins: "Tin Deposits near Irish Creek," "Geological Map of Buchanan County," and "Geological Map of the Western Foot of the Blue Ridge." Michigan completed the following reports: "Mineral Resources for 1917," "Report on Lakes of Michigan," "Monograph on Mushrooms," "Macinac Island," and "Marshall Formation." Minnesota has almost completed a report on the magnetic attractions of the east Mesabi range.

Surface and Underground Waters.—New Jersey, Oklahoma, Wisconsin, Mississippi and Alabama continued their work of collecting well-record data. Maryland, Michigan and Texas were able to be of assistance in the location of water supplies for the cantonments of those states. The map in connection with the report on King's Quadrangle, Ill., shows shallow and deep water resources, and the depth of the water table and of bedrock. New Jersey made investigations of water powers on several streams, studies of flows of streams and results of water diversion, also a report on ground-water conditions. Colorado made a report on the mineral waters of that state. The study of underground water was continued in Connecticut. In Iowa all available data regarding surface water were collected and a report published. The North Carolina Survey published the *Proceedings of the Ninth Annual Drainage Convention of the North Carolina Drainage Association.* Oklahoma, in a surface map of Custer County, showed all drainage features. That Survey also made a special study of mineral springs and artesian wells. The Wisconsin Survey is continuing its study of the plankton and temperatures of Wisconsin lakes.

Soil, Forest, and Highway Investigations.—Soil surveys of seven counties were completed in Virginia, approximately 900 sq. miles. Minnesota published a soil map of the southern half of that state. In New Jersey 850 sq. miles were surveyed and mapped. Base maps suitable for soil surveys of 1,256 sq. miles were made in Tennessee. In Wisconsin soil surveys of several counties were published, and much work was done in connection with the state Highway Commission, of which the state geologist is a member. Special search was made for highway materials in Alabama, New Jersey, Missouri and Oklahoma. New Jersey, North Carolina and Oklahoma laid much emphasis on forestry work. North Carolina assisted the Government in putting owners of walnut timbers in touch with purchasers and in discovering new supplies of these woods. Tennessee also aided the Government in locating timber supplies, especially black walnut, which is used in gun stocks, and black locust for ship pins.

RECLAMATION

FRED G. HARDEN

The Reclamation Service.—The Reclamation Service was authorized by the Sundry Civil Appropriation Act approved July 1, 1918, to spend $9,345,000 and certain unexpended balances of the sum appropriated in 1917 upon its several projects during the year ending June 30, 1919. The Act also provided $100,000 for investigations and secondary projects, and $100,000 for an investigation of the possibilities for reclamation by drainage of lands outside the existing projects of the Service and for the reclamation and cultivation of cut-over timber lands in any of the states of the United States. The total estimated expenditures for the year ending June 30, 1919, is placed at $7,502,450.

The total costs of the Service for the year ending June 30, 1918, was $6,590,975.45, and the total revenues $1,213,568.87, making the total net cost of construction up to that date $118,048,422.66. The total cash collections for the year ending June 30, 1918, were $3,520,436.56, making the total since the passage of the Reclamation Act $24,484,104.44. The chief items during the fiscal year 1918 were: construction charges, $1,353,144.64; operation and maintenance, $851,290.26; temporary water rentals, $623,993.98; power and light, $223,594.16; and miscellaneous, $409,441.35; making the total collections for these items: construction charges, $6,055,928.30; operation and maintenance, $3,732,887.49; power and light, $1,470,486.04; and water rentals, $4,968,749.18.

During the crop year 1917 the Service was prepared to furnish water to 1,599,525 acres. Of this, 1,036,013 acres were irrigated and 975,358 acres cropped. The total value of the crops reported was nearly $57,000,000, or nearly $59 per acre. The increase of aproximately 50,000 acres in the area irrigated was due in part to the temporary leasing of uncultivated lands by the Service to aid in war production. The policy has met with favor as the lands are thus cleared, levelled, and prepared for irrigation without cost to the United States, and are ready for the incoming settler to produce a crop the first year. The acreages in the principal crops and the average values per acre of the crops are given in the following table:

Crop	Acreage	Average Value per Acre
Cereals	235,057	$34
Alfalfa seed	8,730	43
Other grains and seed	48,200	45
Alfalfa hay	389,477	52
Vegetables and truck	59,293	127
Fruits and nuts	37,738	125
Sugar beets	32,924	69
Cotton	40,166	162

Besides supplying the lands in its own projects, the Service furnished 82,142 acre-ft. to lands under the Warren Act (36 Stat. 925), as follows: Boise Project, 34,256 acre-ft.; Minidoka Project, 34,945 acre-ft.; North Platte Project, 6,941 acre-ft.; and Strawberry Project, 6,000 acre-ft.

The Service during the year ending June 30, 1918, increased the area to which it could supply water 87,942 acres; the area under water contracts, 170,397 acres; the mileage of canals, 468 miles; and the mileage of drains, 121 miles. Over 8,998,000 cu. yds. of excavating was done, and over 210,800 cu. yds. of materials was placed in dams and over 40,500 cu. yds. in dikes and levees. The following table gives the chief construction items from the passage of the Reclamation Act to June 30, 1918.

Estimated area in projects when completed, acres	3,082,902
Estimated number of farms when completed	62,477
Estimated area to which Service could supply water on June 30, 1918, acres	1,885,753
Acreage under contracts on June 30, 1918, acres	1,517,685
Capacity of reservoirs on June 30, 1918, acre-ft	9,197,460
Length of canals with capacity over 50 sec.-ft., miles	2,894
Length of canals with capacity under 50 sec.-ft., miles	7,544
Length of waste ditches and drains, miles	1,301
Tunnels, ft	142,237
Dams: Masonry, cu. yds	2,084,187
Earth, cu. yds	9,998,351
Rock-fill and crib, cu. yds	1,185,529
Dikes and levees: length, ft	504,426
volume, cu. yds	4,470,702
Canal structures: Concrete	28,532
Wood	60,676
Pipes: Concrete, metal, and wood, ft	1,307,102
Tile, ft	1,166,337
Flumes, length, ft	605,173
Canals, lined, length, miles	311
Power developed, h. p	48,093
Excavation: Earth, cu. yds	141,015,518
Indurated material, cu. yds	9,569,457
Rock, cu. yds	8,199,793
Riprap, cu. yds	1,735,893
Paving, sq. yds	807,485
Concrete, cu. yds	2,976,448
Cement, bbl	2,919,107

On Nov. 1, 1917, the Service turned the Salt River Project in Arizona over to the water users to operate. This Project, which consists of the Roosevelt Dam with a storage capacity of 1,300,000 acre-ft. and 800 miles of canals, cost up to June 30, 1917, over $10,500,000; during the crop year 1917 water was delivered to 200,000 acres on the Salt River Project and crops worth nearly $13,700,000 were produced.

Carey Act Lands.—Under the Carey Act (28 Stat. 372) there was during the year ending June 30, 1918, a small increase over the preceding year in the area in segregations applied for (from 6,116.32 acres to 55,668.2 acres) and in the acreage segregated (from 3,247.28 acres to 43,814.06 acres), but a decrease in the acreage patented (from 42,063.55 acres to 11,643.96 acres). Under the Act of March 15, 1910 (36 Stat. 237), providing for the temporary withdrawal of lands during investigations, there was no application for a withdrawal during the year ending June 30, 1918, as compared with applications for 10,782.65 acres in the preceding year. The acreage withdrawn and that restored to entry were 2,595.99 acres and 80,475.78 acres, respectively, during the year ending June 30, 1918, as compared with 48,629.37 acres and 85,833.23 acres, respectively, during the preceding year. The following table shows the status of the lands applied for under the original Carey Act and the Act of March 15, 1910, from the time of the passage of each up to June 30, 1918:

IRRIGATION PROJECTS OF THE U. S. RECLAMATION SERVICE

State	Project	Appropriation, Fiscal Year 1919	Net Investment to June 30, 1918	Total Charges Collected to June 30, 1918			Irrigated Acreage, Crop Season 1917			
				Construction	Operation and Maintenance	Miscellaneous	Acreage Service Could Supply	Acreage Irrigated	Acreage Cropped	Average Value of Crops per Acre
Arizona	Salt River	$797,000	$10,337,500.75	$232,135.51	$22,174.89	$4,079,475.96	212,960	201,600	188,500	$72.60
Arizona-California	Yuma	590,000	8,859,515.48	296,914.22	107,963.23	647,548.27	65,000	36,956	35,578	105.47
California	Orland	95,000	871,379.66	39,099.72	25,077.83	136,670 68	20,480	12,729	9,608	56.57
Colorado	Grand Valley	348,000	3,255,585.17			75,025.30	35,000	5,289	4,523	44.00
	Uncompahgre	185,000	6,498,048.68			730,348.56	85,000	53,108	52,717	57.89
Idaho	Boise	732,000	11,667,535.67	201,011.81		1,221,592.44	223,000	95,524	88,732	49.44
	King Hill	423,000	212,483.55			4,180.34				
	Minidoka	489,000	4,825,670.83	786,480.96	576,602.91	434,953 49	120,850	99,020	92,456	55.15
Kansas	Garden City		338,214.61	142.50	104.50	42,753 18				
Montana	Huntley	112,000	1,499,996.68	290,616.33	162,395.79	92,906.13	31,892	19,122	19,105	36 16
	Milk River	[1]186,000	3,163,419 39			73,295 20	45,000	11,058	10,893	19 13
	St. Mary Storage		2,459,857.52			64,590 84				
	Sun River	[2]222,000	3,345,723.68	142,671.56	61,065.29	73,849.68	16,224	6,675	[3]7,445	29.43
Montana-N. Dakota	Lower Yellowstone	55,000	3,224,851.85	41,781.75	36,895.25	116,049 95	42,232	15,744	15,659	29.35
Nebraska-Wyoming	North Platte	[1]881,000	8,865,187.59	656,342.42	551,675.96	165,272.57	129,778	92,553	89,334	41.92
Nevada	Truckee-Carson	[1]671,000	6,003,063.88	341,926.53	284,376.67	193,978.66	70,915	40,392	39,236	37.00
New Mexico	Carlsbad	75,000	1,219,084 30	185,911.67	200,051.64	37,180.23	24,775	16,882	15,729	39.66
	Hondo		372,102.69			34,641.67				
New Mexico-Texas	Rio Grande	[1]1,296,000	6,776,032.68			763,159.25	88,000	64,308	63,626	56.50
North Dakota	N. D. Pumping	64,000	944,646.07	9,704.97	13,352.56	145,930.69				
Oklahoma	Lawton	1,000	13,798.17			.20				
Oregon	Umatilla	[1]80,000	2,263,260.24	246,469.76	110,500.79	112,123.18	26,300	7,335	5,546	56.15
Oregon-California	Klamath	423,000	2,656,522 02	345,816.87	193,663 62	77,541.91	44,715	33,635	32,929	25.73
South Dakota	Belle Fouche	262,000	3,374,225.11	260,664.15	239,365 58	99,580.31	83,335	50,272	50,026	23.50
Utah	Strawberry	[1]59,000	3,332,003 57	82,829.38	36,681.81	276,345.32	50,000	27,147	25,620	50.37
Washington	Okanogan	154,000	783,855.45	32,310.38	46,483.91	113,405 17	10,099	8,000	6,314	96.88
	Yakima Storage		3,323,265.34	413,355.35	21,692.03	189,668.51				
	Yakima-Sunnyside	[1]654,000	2,538,696 44	796,808.23	721,837.72	118,871.17	97,285	80,500	65,803	121.67
	Yakima-Tieton		2,843,976 38	382,218.37	231,666.32	79,505.61	33,422	25,400	24,425	94.30
Wyoming	Shoshone	[1]400,000	5,086,964.56	364,657.11	181,305.76	257,667.85	43,263	32,764	31,554	33.63
Secondary projects		100,000								
Investigations		100,000								
Total		9,545,000	110,976,568.01	6,149,869.55	3,824,934.06	10,458,112.32	1,599,525	1,036,013	975,358	58.95

[1] Together with unexpended balance 1917.

[2] Together with $100,000 of unexpended balance 1917.

[3] Some unirrigated lands included.

State	Under Act of Aug. 18, 1894			Under Act of March 15, 1910	
	Segregated, acres	Patented, acres	Remaining Segregated, acres	Withdrawn, acres	Remaining Withdrawn, acres
Arizona	....	....	....	33,270.76	18,240.00
Colorado	284,653.97	11,511.36	190,806.28	676,318.29	69,333.88
Idaho	1,321,454.92	531,468.27	476,280.43	346,245.81	21,164.77
Montana	228,973.84	30,683.69	118,448.28	41,007.50	....
Nevada	36,808.59	....	12,246.02	679,051.37	4,521.56
New Mexico	7,564.68	....	7,564.68	15,861.60	....
Oregon	387,078.30	62,718.34	224,672.09	236,952.92	75,497.64
Utah	141,814.94	25,814.65	59.854.59	363,309.31	....
Wyoming	1,347,079.38	152,966.50	941,922.09	149,638.63	24,233.83
Total	3,755,428.62	815,162.81	2,031,794.46	2,541,656.19	212,991.68

U. S. Department of Agriculture.—The amounts carried by the Agricultural Appropriation Act approved Oct. 1, 1918, for investigations along the lines of irrigation and drainage for the year ending June 30, 1918, were slightly smaller than those for the preceding year, being as follows: investigations in connection with western irrigation agriculture and the utilization of lands in the Reclamation Service projects, $73,580; investigations pertaining to the utilization of water in farm irrigation, $82,440 .investigations as to farm drainage and the drainage of swamp and other wet lands, $73,760; demonstrations on Reclamation Service projects, $48,600; and experiments in dairying and live-stock production in arid and irrigated districts, $40,000.

Private Irrigation.—More efficient use of irrigation water has been given considerable attention during the year in several states, notably California, Colorado and Utah. In California the coöperative work of the Public Utilities Commission, the Water Commission, and the University of California has been continued, and much stress has been laid on increasing the production of irrigated areas as much as possible during the war. In Colorado a state Committee on Water Conservation has been appointed, and in Utah the Water Right Commission created to draft a new water code has continued its investigations started in 1917. The Committee on Irrigation of the Society of Agricultural Engineers, also appointed in 1917, reported, its report being based upon the answers to a questionnaire sent to canal and project managers, Government and state irrigation officials, and investigators along the lines of irrigation and drainage. The questionnaire consisted of 12 questions dealing with the present use of irrigation waters and the possibilities of extending the areas irrigated by more economic use of the waters, and 12 questions dealing with the prevention of waterlogging of soils and the concentration of alkali by over-irrigation and seepage from canals. Practically all the answers agreed that the areas irrigated could be considerably extended if water was used more carefully.

On Feb. 16 a coöperative agreement was entered into by the Imperial Irrigation District (California) and the Secretary of the Interior for the purpose of making investigations, surveys and estimates of the cost of building an All-American Canal from the Laguna Dam of the Reclamation Service to the lands of the district in the Imperial Valley. On July 6 the Secretary of the Interior and the Imperial Laguna Water Co. entered into an agreement by which the latter was to make surveys, specifications and estimates of the cost of diverting water from the Colorado River at the Laguna Dam and conveying it to an area of about 500,000 acres south of the Salton Sea in the Imperial Irrigation District and to about 600,000 acres not in the district. The engineers reported that a gross area of 751,000 acres could be covered, 606,600 acres of which could be reached by gravity and 31,000 acres by pumping. They estimated the cost on the basis of 450,000 acres at $26 per acre. The engineer representing the

Secretary of the Interior concluded that the data obtained were not sufficient to justify estimates as to either the total cost or the cost per acre.

Irrigation Legislation and Judicial Decisions.—The case of State of Wyoming *vs.* State of Colorado (*A. Y. B.*, 1917, p. 263) was reargued before the U. S. Supreme Court early in January but as yet no decision has been handed down. The irrigation-district law of Oregon was upheld in the Supreme Court of that State in the cases of Links *vs.* Anderson (168 Pac. 605 and 1182) and Herrett *vs.* Warmsprings Irrigation District (168 Pac. 609). The New Mexico artesian-well law passed in 1915 (Chap. 6, Code 1915) was upheld by the New Mexico Supreme Court in Eccles *vs.* Ditto (167 Pac. 726). The Nevada water law, which was upheld by the U. S. District Court during 1917 (*A. Y. B.*, 1917, p. 263), was declared constitutional by the Nevada Supreme Court in Vineyards Land & Stock Co. *vs.* District Court of Fourth Judicial District of Nevada (171 Pac. 166).

Drainage.—Drainage construction was materially reduced during the year by the high cost and shortage of labor and materials and by the fact that war conditions have made it difficult to float bond issues. In some sections the cost of tile alone has increased more than 35 per cent. and in other sections it is almost impossible to purchase it. The bonds of the Los Angeles County Flood Control District were validated during the year by the Supreme Court of California, thus making available $4,450,000 of bonds issued by the County and $1,080,000 appropriated by the Federal Government. The Supreme Court of Idaho in Burt *et al.* Commissioners *vs.* Farmers' Coöperative Irrigation Co. and Noble Ditch Co. reaffirmed its former decisions upholding the drainage-district law of that state, holding in the present decision (168 Pac. 1078) that irrigated lands which by seepage and saturation contribute to the swampy condition of low lands should contribute to the cost of reclaiming such low lands. The Court further held that it was the intention of the legislature of the state that rights of way of canals from which seepage water escapes and contributes to the waterlogging of lands included in a drainage district should be assessed a just proportion of the cost of constructing works in the drainage district.

Lands for Returning Soldiers.—President Wilson in his message to Congress on Dec. 2 recommended the passage of the legislation necessary for carrying into effect the plan outlined by Secretary of the Interior Lane for employing returning soldiers in reclaiming arid, wet and cut-over lands, the lands so reclaimed to be used for providing homes for the returning soldiers. According to the Secretary's estimates, there are more than 15,000,000 acres of irrigable lands still belonging to the United States; 70,000,000 to 80,000,000 acres of swamp or overflowed lands, of which 60,000,000 acres can be reclaimed and made profitable for cultivation; and more than 200,000,000 acres of cut-over timber lands suitable for agricultural development. Much of the last two classes are naturally in the hands of the states or individuals, and the Secretary's plan contemplates the coöperation of the Federal Government, the states, and private individuals and companies. The work of reclamation other than the planning is to be done by the returned soldiers under direction, and the lands are to be turned over to the soldiers as prepared homes with a long period in which to pay for them instead of as unbroken, unprepared desert, swamp or stump lands. The work has been begun under a $100,000 appropriation in the Sundry Civil Appropriation Act approved July 1, 1918, for an investigation to be made by the Reclamation Service of the possibilities for drainage outside the projects of the Service and the possibilities for the reclamation and preparation for cultivation of cut-over timber lands in any part of the United States. The United States has been divided into three sections for the purpose of making the investigations and an engineer assigned to the work in each section. An expert in matters of land settlement and colonization has been appointed, and has begun work along the lines of the problems of settlement and plans for the repayment of the costs of reclamation.

Land Settlement in California.—The California legislature in 1917 created a State Land Settlement Board and placed $260,000 at its disposal as a loan to be repaid in 50 years at four per cent. The Board is authorized to acquire lands and contract for the settlement. At any time before disposing of the lands or within five years after the beginning of the settler's purchase contract, the Board may prepare the lands by irrigation and cultivation; may seed, plant, and fence the lands and cause dwellings and other buildings to be erected on any farm at a cost not to exceed $1,500; may erect farm laborers' cottages at a cost of not to exceed $800 on any allotment; and loan settlers money upon the security of stock and improvements, provided that the total loan on any farm, together with the cost of the buildings built by the Board, shall not exceed $3,000. The law further provides that purchasers must make an initial cash payment equal to five per cent. of the appraised value of the land and 10 per cent. of the value of the improvements thereon, and also that in case the purchaser cannot pay 50 per cent. of the purchase price in cash he must immediately apply to the Federal Farm Loan Bank for such amount. All payments must be made within the time fixed by the Board but such time cannot exceed 40 years. All deferred payments are to bear interest at five per cent. Each settler must take up residence on his farm within six months and reside on it eight months out of each year for at least 10 years unless prevented by reasons satisfactory to the Board. No allotment can be transferred, assigned, mortgaged or sublet during the first five years. In case a settler does not comply with his contract the state and the Board have the power to cancel the contract and hold all payments made as rental paid for occupancy.

During 1918 the Board opened two tracts totaling 6,219 acres in the vicinity of Durham. These tracts were purchased by the state at an average price of $100 per acre. The Board brought about an adjustment of the water rights affecting the lands, had the soils mapped by the University of California, had the irrigation and drainage systems and the farm building designed and constructed under the supervision of state and Federal offices, planted part of the lands to crops, subdivided the tracts, and appraised the farms and allotments. The first tract was opened in June and consisted of 63 farms and 21 farm-laborer allotments of 1¾ to two acres each. There was at least one applicant for each farm or allotment and the farms sold from $60 to $235 per acre, the average being $150. The second tract was opened in November and consisted of 31 farms and five laborer allotments. These lands sold from $48 to $235 per acre and there were 10 to 14 applicants for each unit. Each applicant was required to furnish his record, was interviewed by the Board, and required to have $1,500 in cash or its equivalent in implements or live stock. All payments are to be made within 20 years.

HIGHWAYS

ANDREW P. ANDERSON

Traffic Developments.—In the field of highway engineering the year 1918 was marked chiefly by a tremendous increase and expansion in the amount of heavy motor-truck traffic on our public roads, an unprecedented situation in regard to road materials, labor and finance, and a decided decrease in the amount of all classes of highway work except maintenance.

Five years ago heavy motor trucks were few in number and limited practically entirely to the streets of our larger cities. These vehicles now comprise probably four or five per cent. of the total of all our motor vehicles and are to be found wherever traffic conditions permit of their profitable use. Few, if any, of our present roads were designed to carry any large volume of this class of traffic; consequently, the cost and difficulty of adequate maintenance has been greatly increased. In many places the damage due to the incessant pounding of these heavy and swiftly moving vehicles has been so great as to require complete reconstruction. This damage was especially severe during the months of late winter and early spring.

Federal Control of Highways.—The necessity of conserving and directing the producing and transporting powers of the nation toward the most successful prosecution of the war led to the establishment of the U. S. Highways Council on June 8. This Council was composed of one representative from each of the following bodies: Department of Agriculture, War Department, War Industries Board, Railroad Administration, and Fuel Adminstration. The original membership of this Council, which continued throughout, was as follows: L. W. Page, chairman, Department of Agriculture; Lieut. Col. W. D. Uhler, War Department; G. W. Kirtley, Railroad Administration; Richard L. Humphrey, War Industries Board; and C. G. Sheffield, Fuel Administration. This organization provided at once a practical means of coöperation between the different bodies charged with the administrative functions of the laws and regulations pertaining to all matters vital to both the prosecution of the war and road work. On Aug. 5 the Council announced a definite and comprehensive policy and method of procedure as to all highway and street work during the period of the war. The more essential features of this policy are stated as follows:

> All proposed highway, street, culvert, and bridge construction, reconstruction, and maintenance involving: (*a*) the issuance of bonds; (*b*) the use of rail or water transportation; (*c*) the use of coal or oil as fuel; or (*d*) the use of cement, brick, asphalt, oil, tar, crushed stone, or steel (also sand and gravel where shortage exists), as highway material, should first be submitted for approval to the United States Highways Council through the appropriate state highway department. No manufacturer will furnish any road building material until the project has been approved by the United States Highways Council.
>
> The Council in passing upon the projects which come before it will give first consideration to maintenance with a view to conserving all the highways already completed if possible.
>
> Reconstruction will be favorably considered by the Council only where it is clearly established that maintenance is no longer possible except at prohibitive cost.
>
> New construction will be given consideration by the Council in the following relative order of importance:
>
> (1) Highways and streets of military value;
> (2) Highways and streets of national economic value;
> (3) Unfinished contracts involving contractural obligations (incurred prior to April 5, 1918, where bond issue is involved) which may not be disturbed without serious consequences;
> (4) Streets and highways which although not of national economic importance are of such extreme local importance or the construction of which has progressed to such a point as to cause serious hardships if their construction or completion is postponed.
>
> State highway departments are requested to give most careful consideration to each application on its merits in the light of the policy announced by the Council and to exercise the power of disapproval freely. Only the projects approved by the state highway department will be considered by the Council unless the department itself is in doubt and wishes a decision in the nature of a precedent.
>
> The Council will shortly begin, in coöperation with the Office of Public Roads of the Department of Agriculture, and the state highway departments of the several states, the preparation of a programme of road and street construction, reconstruction and maintenance throughout the United States for the working season of 1919. The purpose of the programme is to obtain an approximation of the character and amount of street and highway work deemed essential in 1919 together with an approximation of the amount and character of financing required, the amount and character of the various materials entering into the work, the extent to which rail and water transportation will be involved, and the probable demands upon the labor supply. The preparation of the programme in each state will be directed by the state highway department, and will cover all state, county, township, and municipal highway and street work.

On Nov. 13, two days after the signing of the armistice, it was decided that further control by the Highways Council was unnecessary. Consequently the above programme was not carried to completion, and by the close of the year the nation had practically returned to its pre-war basis in regard to the control of all lines of road work, except that approval of bond issues was still required by the Capital Issues Committee.

Construction and Maintenance.—The effect of all the conditions incident to the war has been to reduce

STATE HIGHWAY EXPENDITURES, 1917

State	Source of Funds		Distribution of Expenditures			State Funds Available, 1918 (approximate)	Local Expenditures, 1917, not under State Highway Department (approximate)
	State	Local	Construction		Maintenance of Roads and Bridges		
			Roads	Bridges			
Alabama	$89,511	$79,511	$131,530	$17,643	....	$154,000	$2,500,000
Arizona	543,422	....	289,353	136,856	$57,288	1,000,000	1,026,000
Arkansas	80,262	1,545,000	1,345,000	200,000	....	300,000	1,710,000
California	3,058,030	128,170	1,918,740	(1)	687,100	2,500,000	[2]15,059,000
Colorado	703,000	767,000	862,000	[3]270,000	270,000	900,000	1,100,000
Connecticut	2,197,264	330,962	[4]1,029,410	271,260	994,402	3,600,000	1,476,000
Delaware[6]	21,600	....	....	....	1,286	200,000	300,000
Florida	23,797	....	....	....	....	200,000	6,361,000
Georgia	1,910	16,440	9,500	500	....	10,000	4,300,000
Idaho	473,132	369,591	391,676	134,219	126,806	600,000	1,250,000
Illinois	1,258,338	1,810,390	2,735,935	46,683	40,503	2,000,000	7,015,000
Indiana	14,000	....	2,539	....	....	1,050,000	14,000,000
Iowa	89,787	15,535,619	2,506,241	[3]6,223,637	5,685,781	700,000	....
Kansas[5]	10,000	....	....	....	....	25,000	6,000,000
Kentucky	1,501,650	1,422,000	2,844,002	(1)	....	950,000	2,000,000
Louisiana	182,295	358,681	430,708	35,984	9,841	200,000	3,000,000
Maine	1,112,675	632,308	1,019,755	150,973	438,676	1,000,000	1,500,000
Maryland	2,804,707	278,975	1,857,549	387,065	730,652	3,000,000	3,000,000
Massachusetts	4,231,802	601,000	2,261,354	78,195	2,090,000	4,000,000	4,662,000
Michigan	1,704,359	3,968,794	5,125,224	187,751	247,178	2,000,000	5,517,000
Minnesota	1,429,865	2,722,895	2,290,541	[8]922,346	672,039	1,600,000	3,872,000
Mississippi	6,500	....	....	....	....	6,500	3,250,000
Missouri[5]	367,913	7,021	190,645	....	148,068	1,250,000	7,000,000
Montana	25,729	239,140	15,500	223,640	....	150,000	3,092,000
Nebraska[5]	9,500	93,900	....	94,000	4,200	450,000	4,500,000
Nevada[5]	36,796	....	....	....	....	300,000	300,000
New Hampshire	589,254	449,451	448,002	....	505,014	650,000	1,200,000
New Jersey	1,501,902	2,778,995	758,049	56,023	3,302,333	5,500,000	2,000,000
New Mexico	280,578	265,289	233,526	60,000	159,800	350,000	300,000
New York	9,432,679	2,282,452	5,635,027	....	4,537,709	14,000,000	[11]9,970,000
North Carolina[7]	20,000	....	....	....	....	300,000	5,500,000
North Dakota	28,638	1,341	[12]1,676	....	....	250,000	2,838,000
Ohio	2,835,649	2,181,456	3,171,895	288,117	1,145,886	4,000,000	7,000,000
Oklahoma	286,922	2,888,433	374,653	1,486,525	705,136	1,750,000	547,000
Oregon	711,000	....	475,418	9,172	....	1,500,000	5,000,000
Pennsylvania	4,351,566	111,768	251,959	80,445	3,347,906	6,000,000	7,000,000
Rhode Island	486,725	....	....	40,262	387,116	750,000	375,000
South Carolina[5]	27,161	....	....	....	....	25,000	1,250,000
South Dakota[13]	5,000	....	....	....	....	100,000	2,750,000
Tennessee	231,500	50,000	....	....	250,000	1,100,000	2,200,000
Texas[13]	10,000	....	....	....	....	600,000	10,000,000
Utah	120,200	822,929	471,553	48,393	264,538	750,000	950,000
Vermont	578,883	376,606	466,881	45,114	402,010	600,000	725,000
Virginia	695,171	1,641,608	1,754,243	144,102	298,868	1,400,000	1,800,000
Washington	2,031,392	92,299	1,896,821	(1)	[14]138,596	3,500,000	4,992,000
West Virginia[13]	....	2,700,000	2,400,000	300,000	....	350,000	5,500,000
Wisconsin	1,050,888	3,335,666	3,650,560	431,206	....	2,430,000	5,500,000
Wyoming[5]	37,845	2,846	673	5,992	....	70,000	549,000
Total and av'age	47,290,796	50,888,536	49,248,138	[16]12,376,103	27,648,732	74,120,500	181,736,000

[1] Included under roads. [2] Does not include San Francisco County. [3] Includes culverts. [4] Includes $80,085.34 for elimination of dangerous conditions on trunk line highways. [5] State Highway Department organized during year. [6] By counties. [7] Estimated; exact data not obtainable. [8] Includes 415 culverts. [9] Remainder not segregated from expenditures of irrigation department. [10] State and county highways only. [11] Town highways and bridges, includes $2,664,000 of State funds. [12] Does not include $58,945.43 of local funds expended under supervision of State engineer's office. [13] Complete data not available. [14] To June 15, 1917, only. [15] County supervision. [16] Partial totals.

the amount of new highway construction to about one-half of that of 1916, which was the last normal year in road-construction work. However, through the strenuous efforts of the several state highway departments, maintenance work has been pushed with great vigor in spite of the most serious difficulties in securing labor and materials. As a result, the wear and damage due to the heavy motor-truck traffic has been, in general, kept

ROAD MILEAGE, 1917

State	Work Done under State Supervision, 1917			Total All State and State-aid Roads Built to Jan. 1, 1918	Mileage of Rural Public Roads		
	State and State-aid Roads Built	Roads Maintained with State Aid	Number of Bridges Built by State or State Aid		Total All Surfaced Roads in State (approximate)	Total All Public Rural Roads in State	Percentage of Surfaced Roads in State
	Miles	Miles					
Alabama	[1]67	....	3	726	6,050	55,446	10.9
Arizona	[2]50	270	8	422	425	12,075	3.5
Arkansas	225	....	10	759	1,725	50,743	3.4
California	313	2,213	17	2,220	12,800	61,039	20.9
Colorado	[3]1,120	4,000	[4]145	[5]8,425	2,500	39,780	6.3
Connecticut	59	1,457	8	[6]1,686	3,160	14,061	22.4
Delaware	....	19	....	160	300	3,674	8.2
Florida	....	....	....	....	3,800	17,995	21.1
Georgia	[7]7	....	2	7	13,200	80,669	16.4
Idaho	[7]75	451	76	488	825	24,396	3.4
Illinois	[8]470	449	88	1,237	12,750	95,647	13.3
Indiana	....	....	....	....	31,000	73,347	42.5
Iowa	[9]1,332	109,000	[10]45,000	1,338	1,400	104,074	1.3
Kansas	....	....	....	....	1,500	111,052	1.3
Kentucky	[24]698	....	....	2,000	13,900	57,916	24.0
Louisiana	83	500	....	837	2,700	24,563	11.0
Maine	170	3,750	[12]19	1,968	3,420	23,537	14.5
Maryland	96	1,189	6	1,400	3,000	16,459	18.2
Massachusetts	[13]158	1,559	24	2,094	9,050	18,681	47.5
Michigan	1,053	3,940	24	4,993	10,600	74,190	14.3
Minnesota	[14]1,984	11,439	[15]749	11,995	6,900	93,517	7.4
Mississippi	....	....	....	....	2,700	45,779	5.9
Missouri	28	11,361	....	[16]	7,500	96,041	7.8
Montana	29	....	38	59	850	39,204	2.2
Nebraska	....	....	6	....	1,400	80,272	1.8
Nevada	....	....	....	....	340	12,182	2.8
New Hampshire	[17]82	1,388	....	1,362	1,975	14,020	14.1
New Jersey	66	2,500	4	2,120	6,050	14,817	41.0
New Mexico	75	2,200	21	921	600	11,873	5.0
New York	410	6,639	[18]679	7,175	18,400	79,398	23.2
North Carolina	....	....	....	....	6,850	50,758	13.5
North Dakota	7	....	....	7	1,150	68,796	1.7
Ohio	289	2,053	850	1,650	31,800	86,354	36.8
Oklahoma	[19]794	2,153	[10]1,904	2,694	500	107,916	.5
Oregon[11]	75	....	....	488	4,950	36,819	13.4
Pennsylvania	[20]10	8,844	83	2,000	10,600	91,556	11.6
Rhode Island	....	325	7	325	750	2,170	34.5
South Carolina	....	....	....	....	3,800	42,226	9.0
South Dakota	....	....	....	....	800	96,306	.8
Tennessee	....	3,200	....	150	8,875	46,050	19.2
Texas	....	....	....	....	12,100	128,960	9.4
Utah	[21]200	3,000	40	3,640	1,550	8,810	17.5
Vermont	116	4,339	64	2,127	2,220	14,249	15.7
Virginia	[22]523	2,153	47	4,986	5,900	53,388	11.0
Washington	324	....	....	2,301	6,225	42,428	14.7
West Virginia	[16]	[16]	....	....	1,600	32,024	5.0
Wisconsin	[23]1,000	....	231	6,070	15,250	77,280	19.8
Wyoming	7	....	8	7	550	14,797	3.8
Total and av'age	11,996	181,391	50,161	80,933	296,290	2,457,334	12.0

[1] Includes 25 miles of earth roads. [2] Includes 16 miles of earth roads. [3] Includes 1,000 miles of earth roads. [4] Also 1,300 culverts. [5] Includes about 6,500 miles of earth roads. [6] Includes about 200 miles of reconstruction. [7] All earth roads. [8] Includes 174 miles of earth roads. [9] Includes 921 miles of earth roads. [10] Includes culverts. [11] Estimated, exact data not obtainable. [12] 11 Not completed. [13] Includes 6 miles of earth roads. [14] Includes 1,570 miles of earth roads. [15] Includes 415 culverts. [16] No data. [17] Includes 13 miles of earth roads. [18] Town bridges. [19] Includes 549 miles of earth roads. [20] Also 199 miles resurfaced. [21] Includes 150 miles of earth roads. [22] Also 129 miles of reconstruction. Includes 90 miles of earth roads. [23] Includes 527 miles of earth roads. [24] Includes 132 miles of earth roads.

within bounds and the original investment in the improvement largely preserved. The expenditures for road maintenance during 1918, therefore, will no doubt considerably exceed those of 1917.

Road Expenditures and Mileage.—The accompanying tables, compiled from *Public Roads* (Vol. I, No. 3, U. S. Department of Agriculture, Bureau of Public Roads), show more fully than is possible in any other way the road work accomplished by the several states through their respective state highway departments and local subdivisons during the year 1917. The table of state highway expenditures does not include the value of the prison and statute labor of the several states, which is estimated at a total of approximately $15,000,000.

WATERWAYS AND HARBORS

ROY S. MACELWEE

General Survey of Progress.—During 1918 the development of the ports and terminals of the United States has been so extensive that it will be necessary in the confines of this article to limit the discussion to the most conspicuous examples of progress. This progress consists primarily in the actual contruction of port improvements by the national and municipal governments, in the appointment of various national, state and local boards for counsel and advice concerning port development, in the renewed interest in "porkless" inland waterways, in the growth of societies for terminal science and in the increased literature on the subject, and in the designs of marine terminals.

Municipal Construction: Seattle.—The great accomplishments of the Army and of municipalities will be more significant in the light of one example at Seattle. There are three new wharf projects, each differing from the others because designed for different kinds of traffic: (1) an overseas freight pier; (2) a local passenger and freight pier; (3) a marginal wharf (quay) and warehouse. The overseas freight pier has a length of 1,035 ft., with the possible extension to 1,800 or 2,000 ft. on determination of the pier-head line. The cross section of this pier gives its chief characteristics. Beginning from right to left a wharf apron at ship side is 20 ft. wide. It carries a railroad track and a moveable platform to serve the upper deck of the pier. This platform runs on crane rails which will also carry a semiportal gantry crane installation if desired. The next element is the transit shed 120 ft. wide. This width is designed to accommodate the entire cargo of a large ship allowing 10 sq. ft. of deck room per cargo ton. The shed floor has a six-foot loading platform towards the two railroad tracks depressed to car-floor level and running down the middle of the pier. The shed roof and upper deck is carried on pillars 40 ft. on center which gives ample clearance between pillars to operate trailer trucks. The 32 ft. space of the depressed railroad tracks divides the pier into two almost independent units, each one the transit point between ships and railroad car. The left side of the pier is identical, and the upper deck has similar dimensions. The middle tracks are spanned by a portable bridge carried by a high shop crane. For loading and discharging there are cargo masts, a platform to carry possible horizontal conveyors, and crane rails. The upper and lower levels are connected by automatic elevators, spiral chutes and belt conveyors.

The local passenger and freight pier is 656 ft. long and 250 ft. wide. From left to right the elements are: a 12-ft. open wharf apron; a 70-ft. shed; a five-foot loading platform on the inner edge of the shed floor; and a depressed paved driveway 50 ft. wide to accommodate drays, dividing the pier down the middle. The movement of freight is across an unobstructed deck between drays and steamer. *The upper deck* is arranged to accommodate passengers, with waiting rooms and steamship offices at the shore end of the pier. It is reached by a ramp from the lower level. The lower pier deck is fitted with floating or chain ramps to accommodate the changing level of the side ports of the vessels. Mechanical conveyors are to be installed.

The marginal wharf and warehouse is 1,000 ft. long. The cross section is the same as half of the overseas freight pier plus the depressed tracks. From the water's edge there is a

20-ft. open wharf apron with one spur track, a 120-ft. transit shed, a six-foot loading platform, and a 32-foot wide railroad track space depressed. A seven story steel and concrete warehouse, 200 ft. wide, parallels the wharf shed. The connection between transit shed and warehouse is across movable platform bridges spanning the spur tracks between the first floor and also across bridges between the second floor of the transit shed and the third floor of the warehouse. Electrical trucks and trailers are the improved means of communication between shed and warehouse. To permit this system all decks and runways are smooth, firm and even. Vertical movement of tractor trains is accomplished by eight automatic elevators of four tons capacity. To the rear of the warehouses are three railroad sidings paralleled by narrow loading platforms.

A very large water frontage for industrial development with water-side connection with the port of Seattle has been opened by connecting the harbor and Lake Washington by a lock canal (*A. Y. B.*, 1917, p. 269).

Portland, Ore.—Portland has begun extensive port improvements along a frontage of 2,500 ft. on the Willamette River, called the Mocks Bottom Terminal. This development consists of a grain elevator of 1,000,000 bus. capacity and five piers or wharves. Pier No. 1 is a marginal wharf with a two-story transit shed and spur railroad tracks on the apron and at the rear of the shed. Pier No. 2 and 3 is a double pier of 480 ft. to 530 ft. width and 1,200 ft. long; it carries two transit sheds separated by depressed spur tracks in the middle, and the wharf apron carries tracks. The slips are 200 ft. wide. Pier No. 4 is 300 ft. wide and open (no shed), with railroad spur tracks. Pier No. 5 is a wharf to carry stock piles of coal with the necessary mechanical handling equipment.

Philadelphia. — Philadelphia has continued its large programme of municipal port improvements by completing at a cost of $660,000 the McKean Street pier of the Moyamensing group above Greenwich point (*A. Y. B.*, 1917, p. 269). This pier, of the local passenger and freight service type, is 250 ft. wide and 600 ft. long. The profile from left to right is a single railroad spur on the wharf apron, a concrete and asphalt cargo deck, depressed roadway down the center for teams and trucks, a second cargo deck and a spur track on a wharf apron. The upper deck is open above the wharf apron; this deck is as above with two spur tracks down the middle of the pier, thus showing a unique development of ship to railroad transfer on the upper deck and steamboat to dray transfer on the lower deck.

Army Construction. — Undoubtedly all private, municipal or state port development is insignificant in comparison with the construction by the United States Army, amounting to more than $200,000,000. The work has been in the hands of the Division of Purchase, Traffic and Storage of the Quartermaster Corps under Major-General Goethals. Although some of the interior depots were not completed before the signing of the armistice and were thereafter discontinued, the important part of the work has been carried through to completion. Although the construction was to meet an emergency, every effort was made to build terminals of permanent future value.

The terminal of Norfolk, Va., with two great piers, eight warehouses, and a railroad-yard capacity for 1,000 cars is a complete unit in accordance with the most modern principles of marine terminal design. Pier 1 is about 300 ft. wide and 1,800 ft. long. It has seven spur tracks, two on each wharf apron and three depressed down the middle, and two transit sheds, one on each half of the pier, of an area of 145,000 sq. ft. each.

Pier 2 is identical with Pier 1, except that the transit sheds are two-decked; the second story is added to accommodate troops or passengers. The berthing space between the two piers is 450 ft. wide with 35 ft. of water. Outside each pier there is a berthing channel of 35 ft. depth with 350 ft. width. The one-story warehouses are eight in number, with 2,016,000 sq. ft. of storage space, located at right angles to the bulkhead line. Thirteen railroad tracks serve these warehouses from a classification yard located well inland. The piers, warehouses, and railroad yards form a complete integral unit. Almost the entire project is on made land, the land being filled by pumping the spoil from the dredged channel. It was begun Feb. 1, 1918, the completion date was set for Dec. 1, 1918, and the estimated cost was $16,438,000.

The great army project at South Brooklyn is primarily for storage. There are three piers, 150 by 1,257 ft., and one pier (open) 70 by 1,300 ft. The railroad classification yards for handling freight which is carfloated from the warehouses to the trunk lines have a capacity for 1,480 cars. The chief interest in the project lies in the two great warehouses with a combined storage area of 3,850,000 sq. ft. conceded to be the largest buildings ever built. Building A is nine stories high, 200 by 980 ft., of steel and concrete construction, and equipped with 27 elevators of 10,000 lb. capacity designed for the vertical movement of unbroken trains of electric tractor-trailer trucks. These move the freight between the warehouses and the piers. Building B, of similar dimensions, is equipped with 36 elevators. Work on this great project was begun on May 17, 1918. The estimated cost of the undertaking is $40,000,000 (see also XX, *Civil Engineering*).

At Boston a new marginal wharf is 1,638 ft. in length. This wharf is equipped with a two-story concrete and steel transit shed 137 by 1,638 ft., with five elevators of 16,000 lb. capacity to take tractor trailers. At the shore side of the shed is a roadway 77 ft. wide with railroad sidings. Five bridges across this driveway connect the second story of the wharf shed with the warehouse. The warehouse, with an area of 1,651,000 sq. ft., are situated directly upland and parallel with the wharf. They are eight stories high and consist of six sections or wings each 126 by 273 ft. The warehouse has 24 elevators of 10,000 lb. capacity to afford vertical movement to trailer truck trains. The railroad yard capacity is 700 cars per day. The project was begun on April 3, 1918, the completion date is Jan. 1, 1919, and the estimated cost is $28,000,000. (See also XX, *Civil Engineering.*)

Other Army projects may be briefly described. At Philadelphia there are two piers, of 382,800 and 435,000 sq. ft. area, respectively, each carrying a three-story shed and four railroad tracks. Connected with them is a railroad yard with a capacity of 500 cars. This project was begun on July 23, 1918; the completion date is Aug. 1, 1919, and the estimated cost is $20,000,000. A temporary interior warehouse completed on Feb. 1, 1918, at a cost of approximately $3,400,000, has an area of 921,000 sq. ft.; and an expeditionary depot completed on May 10 at a cost of over $1,000,000 has an area of 271,000 sq. ft. At New Orleans the Army has projected a two-story wharf shed, 140 by 2,000 ft., giving 300,000 sq. ft. of storage area, and three warehouses to be sold to the N. O. Post Commission with a total storage space of 1,512,000 sq. ft.; the estimated cost of the project is $20,000,000 and completion was expected on Nov. 1, 1918. At Charleston, S. C., the Army began on June 1 a 3,580 ft. wharf with two transit sheds and six warehouses with nine railroad sidings; the estimated cost was $11,550,000 and the project was to be completed by Dec. 1. Important army depots in the interior are at Schenectady, N. Y., six warehouses costing over $3,600,000; Columbus, Ohio, seven warehouses costing a like amount; New Cumberland, Pa., 10 warehouses costing over $4,000,000; and Chicago, a permanent depot, six stories, costing $2,750,000.

Boards and Commissions.—The increased interest in port matters is seen in the creation of various bodies to investigate and improve American port conditions. The United States Shipping Board Commission on Port and Harbor Facilities has coöperated with the Railroad Administration, (1) to relieve port congestion by endeavoring to zone the United States; (2) to shorten the rail haul; (3) to relieve congestion at a few ports by increasing the distribution of traffic among many ports; and (4) to increase the load factor coefficient at backward ports by providing return cargoes. It has also made a thorough investigation of drydock and repair facilities and brought about the construction of 11 new drydocks. The greatest single investigation of any single port problem is being made by the New York-New Jersey Port and Harbor Development Commission, which was created by the legislation of the two states in 1917 (*A. Y. B.*, 1917, p. 268). A fund of $200,000 a year for two years was appropriated to carry on the work. The scope of the work includes all the recognized phases of the port and terminal problem. The legal basis of the future coöperation of the two states in carrying forward constructive recommendations is proposed in the form of a treaty which has its precedent in the treaty of 1834 between New York and New Jersey. Other important bodies are the New Orleans Board of Advisory Engineers, the harbor survey appointed by the San Francisco Chamber of Commerce, the Inland Waterways Committee of the Railroad Administration, the Society of Terminal Engineers (New York), and the American Association of Port Authorities.

Inland Waterways: The Mississippi.—The exigencies of the war have hastened the renaissance of inland navigation in the United States. The war emergency with its car shortage and lack of new railroad construction hastened a condition in which it is to the advantage of all concerned to move low-grade bulk freight by water routes. In its potentialities the greatest system of inland navigation in the world is the Mississippi River and its tributaries. The Railroad Administration and the river towns of this system have been quick to see the new conditon and to try to meet it. On the lower Mississippi navigation was taken over by the Waterways Advisory Branch of the Railroad Administration. The river towns, nearly all of which have improvement projects, have formed a Mississippi Valley Waterways Association with headquarters at St. Louis. St. Louis is building a municipal terminal with a wharf 890 ft. in length, of concrete construction. It carries eight standard railroad tracks on the wharf apron and to the rear of the sheds. The transit sheds, five in number, are 160 ft. long, with 22 ft. of space between the sheds. There are four openings provided in the wharf at these spaces for the future installation of elevators to serve the varying water level. At St. Louis the Army began on Dec. 13, 1917, a great six-story warehouse with a total area of 360,000 sq. ft.; the completion date was Sept. 1, and the estimated cost was $1,368,540.

X. PUBLIC SERVICES

Richard C. Harrison

Franchises.—The effect of the war upon operating costs has created a situation which has made the public-utility franchise problem one of the most complex with which American cities have been called upon to deal in recent years. The street-railway situation in particular has been most troublesome. The need for increased service and the rapidly decreasing purchasing power of money has forced many cities to make material concessions and rate readjustments. There has been too, a large amount of conflict between cities that have refused to change franchise conditions and state public-service commissions that have assumed jurisdiction and granted increases in the exercise of their powers as state agencies. These disputes have frequently been carried into the courts with varying results. In Washington the court passing upon the action of the state Commission in raising the fares of the Tacoma Street Railway held that the franchise was a contract with the municipality which could not be changed without its consent. In New York a similar ruling was made affecting fares in the city of Rochester. In Indiana, on the other hand, the court held in the case of a franchise of the Indianapolis Traction Co. that the City had "acted as the agent of the State in incorporating the rate schedule in the franchise" and that the state Utilities Commission must pass upon the Company's application for an increase. The question has also been under consideration in Missouri, where the Public Service Commission by a vote of three to two granted the petition of the Kansas City Railways Co. for a higher rate. In New Jersey, Oregon and elsewhere the matter has been a source of dispute and local irritation.

In New York City the local surface transit lines have sought to secure the consent of the City authorities to permit the Public Service Commission to investigate and fix the rate of fare, but without success. As the state court has held such consent necessary, the situation has reached a deadlock. The companies predict early bankruptcy and operating reports seem to support their statements.

The Federal Government interested itself in the public-utility question as a war measure. In April Secretary McAdoo wrote to the President calling his attention to the serious situation in which the war had placed the finances of the local public utilities of the Nation. The President in reply said:

> I have examined with care the memorandum and letter which you transmitted to me with your letter. I fully share the view you express regarding the importance of the public service utilities as a part of our national equipment, especially in war time. It is essential that these utilities should be maintained at their maximum efficiency and that everything reasonably possible should be done with that end in view. I hope that the State and local authorities, where they have not already done so, will when the facts are properly laid before them respond promptly to the necessities of the situation.

In 1897 the Boston Elevated accepted a franchise fixing the fare at five cents until 1922. The situation became impossible, however, because of increased operating costs. The Public Service Commission investigated and in February filed a report with the legislature, prepared by Joseph B. Eastman, advocating a novel plan of operation of the property by public trustees. Slightly modified, his plan was adopted. It provides for operation by a board of five trustees appointed by the governor of the state. Fares are to be adjusted on the Cleveland sliding-scale plan (*A. Y. B.*, 1910, p. 228), but without maximum and minimum limits. Dividends are guaranteed to stockholders. The right to take over the property is reserved to the state or to any political subdivision thereof upon the assumption of the outstanding indebtedness and payment in cash for the capital stock. Similar plans are under way for the benefit of the Bay State Street Railway Co. and other Massachusetts street railways.

The famous traction ordinance of March 1, 1910 (*A. Y. B.*, 1910, p. 228) placed the city of Cleveland at the head of low-fare cities. It has been forced to yield the position however, three raises in fares having been made during the year. On April 9 the maximum allowed under the franchise was reached. Four cents cash is now the rate, with seven tickets for 25 cents and one cent for a transfer. Even this rate has proved insufficient and the company has petitioned the City Council to modify its franchise to allow increases whenever necessary to meet higher operating costs.

At the November election Chicago defeated by a substantial vote an important franchise ordinance readjusting its traction situation so as to provide for operation "at cost" by a board of trustees. Walter L. Fisher, former Secretary of the Interior, was the author of the plan.

The Cincinnati street-railway settlement of 1896 was readjusted in 1917, and the new contract, including a lease on the proposed interurban loop line to be built with city funds, was approved by referendum vote in April, 1918. The Ohio Supreme Court has decided in a test suit, however, that the contract is void as violative of the constitutional inhibition against the loan of city credit to a private corporation. Negotiations for a new contract are under way between the city and the traction company.

Philadelphia has completed negotiations for the leasing of its rapid-transit lines and the contract is before the Public Service Commission for approval. The plan of a flexible rate schedule has been adopted, the fares rising or falling with operating results, subject, however, to approval by the state Commission.

Water Supply.—The shortage of labor and materials and the control of new construction by the Federal Capital Issues Committee (see XII, *The Conduct of Business*) have been felt in reducing all public work, including water-supply systems. Work has progressed however on the New York and Los Angeles systems and a number of other cities have brought to completion important projects under way at the outbreak of the war.

In New York an important victory was won by New York City in securing legislation to prevent the possible pollution of its Ashokan supply system through the building in the watershed area of the Mohansic Hospital for the Insane and a reform school for boys at Yorktown Heights. The State acquired the site several years ago and for five years strongly opposed the City's efforts to defeat the project. A law was enacted in 1918, however, turning this site into a state park.

On May 1 the great new Wilson Avenue water tunnel at Chicago was completed, adding 300,000,000 gals. of water a day to the city's available supply. Work was begun on this project in 1914. The bore extends under Lake Michigan for three miles and connects with a large concrete intake crib. The cost of the improvement was $4,550,000.

Water rates in Cincinnati were advanced 25 per cent. in January, making the rate 10 cents per hundred cubic feet with a minimum monthly charge of 40 cents. It is estimated that the city's revenue will be increased $120,000 a year by the change.

In April the new West Side filtration plant at Cleveland was completed. Service began on a small scale in November, 1917, with a daily supply of 8,000,000 gals. The estimated capacity of the plant is 150,000,000 gals. per day. It cost $3,500,000.

On March 4 litigation of over 20 years between the city of Denver and the local water company was brought to a close. In 1895 the first suit was begun through an effort by the city to regulate rates. The city lost. Again in 1897 an effort to regulate the pressure, supply and purity was unsuccessful. In 1900 the city voted to appropriate $14,700,000 for the erection of a municipal plant. The company was successful in enjoining the bond issue. In 1907 the city again sued to enforce lower rates and to receive improvements in quality and pressure, and again lost. In 1910 the company applied for a new 20-year franchise; it was denied and $8,000,000 was voted for a municipal plant. An injunction by the company was obtained and was successfully sustained. Litigation was begun in 1911 on the question of city purchase of the company's plant. A valuation of $13,415,899 placed upon it by W. J. Chinn, special master appointed by the U. S. District Court, was sustained in the U. S. Supreme Court. The question of purchase was submitted to the voters on referendum on March 4, 1918, and was carried by 6,248 to 1,800. It was voted at the same time to place the plant when acquired under a board of managers consisting of John C. Skinner, Benjamin A. Sweet, Frank L. Woodward, Charles H. Reynolds, and F. F. MacFarland.

In Kansas City a bond issue of $1,250,000 was approved by a vote of 33,583 to 2,858, at the spring election for the purpose of constructing a new pumping station and about four miles of new conduit.

By a vote of almost three to one the taxpayers of Newburg, N. Y., have approved the purchase of an independent water supply at an estimated cost of $610,000. The city now purchases water from the City of New York. Options on the so-called Plattekill tract were closed on Sept. 1, and additional land will be taken by condemnation if necessary. It is expected that water will be available by the late fall of 1919.

The city manager of Niagara Falls, N. Y., reports an estimated annual saving of 100,000,000 gals. of water through the repair of leaks discovered through a thorough pitometer survey of the city.

During the year the new filtration plant at Oshkosh, Wis., was completed and placed in operation. It cost $185,000, and has a daily capacity of 6,000,000 gals.

Lighting.—The most important and interesting item with reference to lighting during the year has been the attempt of the Federal Government to save coal through the reduction in the amount of electric current consumed (see also XX, *Electrical Engineering*). The Federal Fuel Administration has adopted from time to time stringent regulations providing for "lightless nights" and has sought through a campaign of education to persuade the public to reduce its consumption of electric current to a minimum. Perhaps even more important in practical results was the passage of the so-called "Daylight Saving" bill by Congress, putting forward the clocks of the country one hour on the last Sunday in March and providing for their turning back on the last Sunday in October. It was, of course, impossible to estimate with any degree of accuracy the amount of electric current saved by these measures, but it was undoubtedly a very substantial amount. The daylight-saving plan met with such popular favor, irrespective of its merits as a measure for saving fuel, that it is seriously proposed to continue the practice annually without reference to war conditions.

There has naturally been a very marked tendency throughout the country to increase the rates for both gas and electricity. In a number of cases the companies have been successful in securing temporary relief as a war measure (see also XX, *Electrical Engineering*). An important rate increase was put into effect in Boston through permission granted to the East Boston Gas Co. to increase its rate for illuminating gas from 80 cents to 95 cents per thousand cubic feet. At the same time the city of Boston secured a substantial reduction in the cost of municipal lighting through the decision of the Massachusetts Gas and Electric Light Commission, finally settling a dispute of three years' standing between the gas company and the city. It is estimated that in the period of the contract, between Nov. 6, 1914, and Nov. 6, 1924, the city will save approximately $600,000.

Los Angeles is making steady and satisfactory progress toward the completion of a great system of municipal hydroelectric plants operated in connection with its new water-supply aqueducts. During the year there was completed a second unit located on the Los Angeles River at its junction with the so-called Franklin Canyon pipe line, about three miles north of Universal City. The cost was $120,000, and the capacity of the new plant is estimated at 4,000 h. p. According to the city's chief engineer, the ultimate plans for the completed system call for a capacity of approximately 217,000 h. p. During the year a city ordinance was approved fixing the rates for industrial power, ranging from 1.56 cents per kilowatt-hour to 0.76 cents per kilowatt-hour; the higher rate is charged to consumers of between 6,000 and 1,500,000 kw.-hrs., and the lower rate for consumption in excess of that amount. Twenty per cent. discount is granted to consumers who use not more than half their current after 4.30 p.m.

The city of Pasadena, Cal., has leased the power-distributing system of the Southern California Edison Co. for a two-year period, paying a rental of eight per cent. on an appraised value of $513,102 and allowing 3.36 per cent. for depreciation. A provision is inserted permitting the city to purchase the plant, in which event it is agreed that the city shall purchase current from the company until April 15, 1933.

During the year electric-power rates for manufacturing purposes in Philadelphia were increased about 10 per cent.

The rate for gas in Salt Lake City, Utah, has been increased to $1.20 per 1,000 cu. ft. for the first 20,000 cu. ft. of consumption, and to $1.10 for the next 20,000 cu. ft., with a discount for payment of bills within ten days of 10 cents per 1,000 cu. ft. The increase was approved by the Public Utilities Commission to continue "during the period of present emergency" only.

The city of Seattle, Wash., has completed plans for the construction of a great new municipal hydroelectric plant located on the Skagit River. On March 1 bids were opened for its construction. The estimated cost is $5,000,000. The local gas company was permitted by the state Public Service Commission to increase its rates 25 per cent., providing an estimated annual increase in the company's revenues of $290,000.

Refuse and Sewage Disposal.—The war has emphasized as nothing else could have done so quickly and effectively the economic importance of the family garbage pail. Federal, state and local attention has been focused on the problem of reducing its contents to the lowest possible point and then utilizing the refuse in industry and agriculture. An example of what the propaganda has accomplished with the aid of necessary economies due to increased food prices is furnished by Chicago, which reports for 1917 an average reduction of about 2,500 tons a month in garbage collections compared with 1916, or approximately 25 per cent. Following a survey of the garbage pails of New York City and the disclosure of a serious amount of waste, the Board of Aldermen adopted an ordinance making wilful waste of food a crime. Studies have been made by many scientific bodies and government officials of methods of garbage utilization. An important report was issued during the year by the University of Wisconsin strongly recommending the establishment of municipal piggeries and stating that the household waste produced by 50 people is usually sufficient to fatten a pig every five months.

In this connection the experience of Worcester, Mass., is interesting. The city disposes of about 70 per cent. of its garbage by feeding it untreated to pigs. In winter about 2,000 are kept on the city farm and in summer about 3,500. This is the largest municipal experiment of the sort in the United States and it is reported to be very successful. During the year there has been a considerable extension of the practice throughout the country. The Federal Food Administration has emphasized the value of garbage treatment and reduction, pointing out that in each ton there is an average of sufficient glycerine to manufacture the explosive charge for 14 75-mm. shells and enough "fatty acid" to make 75 lb. of soap, fertilizer elements sufficient to grow eight bushels of wheat, and a score of other valuable materials. Plans were perfected in a number of cities to manufacture alcohol from garbage, experiments having shown that an excellent grade can be produced by proper treatment. The wasteful practice of incinerating garbage is still in force in many cities but it is inconceivable that it can be continued very much longer. The Food Administration reported in August that in 24 of such cities of over 100,000 inhabitants there was a waste of products worth $5,000,000 a year.

A committee was appointed in 1917 by the General Court of Massachusetts to investigate and report "whether there is any practical economical way of removing from the sewage discharged into Boston harbor any merchantable products contained therein." This committee, which consisted of the chairman of the Metropolitan Water and Sewerage Board, the state health commissioner and the commissioner of public works of Boston, reported in March. The report reviews foreign experience and concludes that it does not feel justified in recommending an attempt to recover commercially valuable products from the sewage. It points out that in Germany, where the most extensive experiments have been made, "various plants erected for the purpose had one after another been pronounced failures and abandoned."

A systematic campaign against the pollution of the waters of the state has been begun in New York through the Conservation Commission. Dr. Harry B. Ward, head of the department of zoölogy of the University of Illinois, has been employed to make an expert study of the extent of pollution and to outline a policy for the cleaning up of the waters of the state. Particular attention will be given in his report to the effect of pollution upon fish life.

The city of Cleveland has been engaged in extensive construction work in order to comply with Government orders to cease the pollution of Lake Erie and the Cuyahoga River with sewage by Feb. 13, 1918. It has already expended $700,000 on the work. Owing to war conditions the city has asked for and obtained an extension of time within which pollution must cease until Feb. 13, 1920, for Lake Erie and July 1, 1920, in the case of the river.

In 1912 the Rockefeller Foundation made a thorough sanitary survey of the city of Savannah, Ga., and recommended extensive changes in the sewerage system. Work was begun soon thereafter and the year 1918 has marked its completion at a cost of about $1,000,000. The new sewers are operated by the gravity system. An important feature of the work was the conversion of several creeks which were really open sewers into closed drains running through concrete tunnels.

Public Service Commissions.—There has been practically nothing worthy of record in the work of the public-utility commissions throughout the country, except such matters as have been touched upon incidentally in connection with the treatment of various matters referred to in this article. In New York it is practically certain that there will be a radical reorganization of the Commissions with a probable reduction in their membership. Governor Smith, who assumed office on Jan. 1, 1919, has recommended in his first message that the membership in each Commission be reduced from five to one, and that the rapid-transit work of the New York City Commission be transferred to a separate official.

Municipal Ownership. — Owing to war conditions and financial difficulties, there has been no notable extension of municipal ownership during the year. There has been, however, considerable talk of the probability of some of the cities having to take over traction and other public-utility lines owing to steadily rising cost of operation and the difficulty of continuing under private ownership without substantial increases in rates.

XI. MILITARY AND NAVAL

THE ARMY

MARLEN E. PEW

Growth During the War.—The rapidity with which the man and material powers of the United States were transformed from the pursuits of peace into a gigantic war machine is the great outstanding feature of the history of American participation in the world war. This country was at war with the Central Powers from April 7, 1917, to Nov. 11, 1918, a total of 583 days. In this period the expansion of the Army ranged from 190,000 to 3,665,000 men, of whom more than 2,000,000 were in France when hostilities ceased. In all history there is nothing to compare with this mobilization of the man power of a nation for war, made doubly remarkable by the fact that less than 300,000 of the men in this vast army had ever received any military training prior to the declaration of war. The steps in this amazing growth are shown in the following table of the strength of the Army in the United States, including foreign possessions, and in the expeditionary forces on the dates specified:

Date	In United States	In Expeditionary Forces	Total
1917			
April 1	190,000	....	190,000
July 1	480,000	20,000	500,000
Aug. 1	516,000	35,000	551,000
Sept. 1	646,000	45,000	691,000
Oct. 1	883,000	65,000	948,000
Nov. 1	996,000	104,000	1,100,000
Dec. 1	1,060,000	129,000	1,189,000
1918			
Jan. 1	1,149,000	176,000	1,325,000
Feb. 1	1,257,000	225,000	1,482,000
March 1	1,386,000	253,000	1,639,000
April 1	1,076,000	320,000	1,796,000
May 1	1,529,000	424,000	1,953,000
June 1	1,390,000	722,000	2,112,000
July 1	1,384,000	996,000	2,380,000
Aug. 1	1,365,000	1,293,000	2,658,000
Sept. 1	1,425,000	1,576,000	3,001,000
Oct. 1	1,599,000	1,834,000	3,433,000
Nov. 1	1,672,000	1,993,000	3,665,000

The following table shows the comparative strength of the various services in March, 1917, and November, 1918:

	March, 1917	November, 1918
Infantry and machine gun	85,000	974,000
Engineer	3,000	394,000
Field artillery and ammunition train	9,000	389,000
Medical	7,000	300,000
Quartermaster	8,000	228,000
Coast artillery	21,000	137,000
Ordnance	1,000	64,000
Signal	3,000	52,000
Cavalry	22,000	29,000
Air service	0	202,000
Motor transport	0	103,000
Militia bureau	0	27,000
Chemical warfare	0	18,000
Tank	0	14,000
In training	....	549,000
All other	31,000	185,000
Total	190,000	3,665,000

Selective Service. — Approximately 23,709,000 males between the ages of 18 and 45, inclusive, registered under the selective-service law. The registration on June 5, 1917, was 9,587,000; June 5, 1918, 735,000; Aug. 24, 1918, 158,000; Sept. 12, 1918, 13,228,000.

The table on the following page shows the number and percentage of soldiers coming from each state and from foreign possessions.

To quote a War Department statement:

> The selective-service law was approved on May 18, 1917; in four days the Provost Marshal General was formally designated, and on June 5, less than three weeks after the enactment of the law, between dawn and dark, the male population of the United States within draft age—approximately 10,000,000 men—presented themselves before some 4,000 boards and were registered. Within 48 hours, due to the organization previously perfected, practically com-

STATE QUOTAS IN THE ARMY

	Number	Per Cent. of Total
New York	328,000	9.5
Pennsylvania	275,000	8.1
Illinois	232,000	6.7
Ohio	185,000	5.4
Texas	155,000	4.5
Michigan	123,000	3.6
Missouri	115,000	3.3
Massachusetts	114,000	3.3
California	102,000	3.0
New Jersey	95,000	2.8
Indiana	93,000	2.7
Iowa	92,000	2.7
Wisconsin	87,000	2.5
Minnesota	83,000	2.5
Georgia	79,000	2.3
Oklahoma	76,000	2.2
Kentucky	72,000	2.1
North Carolina	71,000	2.1
Tennessee	70,000	2.0
Alabama	67,000	1.9
Virginia	67,000	1.9
Louisiana	62,000	1.8
Kansas	69,000	1.7
Arkansas	59,000	1.7
Mississippi	58,000	1.7
West Virginia	52,000	1.5
South Carolina	49,000	1.4
Connecticut	44,000	1.3
Maryland	43,000	1.3
Nebraska	43,000	1.3
Washington	39,000	1.1
Montana	34,000	1.0
Colorado	31,000	0.9
Florida	31,000	0.9
South Dakota	28,000	0.8
Oregon	26,000	0.0
North Dakota	25,000	0.7
Maine	22,000	0.6
Idaho	17,000	0.5
Rhode Island	16,000	0.5
Utah	16,000	0.5
District of Columbia	13,000	0.4
New Hampshire	12,000	0.3
New Mexico	12,000	0.3
Wyoming	11,000	0.3
Arizona	10,000	0.3
Vermont	9,000	0.3
Delaware	7,000	0.2
Nevada	5,000	0.1
Porto Rico	16,000	0.5
Hawaii	6,000	0.2
Alaska	2,000	0.1
Total	3,441,000	100.0

plete registration returns were recorded in Washington.

With this registration achieved, final organization of local and district boards was immediately perfected. There were 4,643 local and 156 district boards. While the law provided that these boards should perform the duty of selecting the particular registrants to render military service, and enumerated certain classes which should be exempt and certain other classes which might be excluded or excused, it intrusted all details of administration to regulations to be prescribed by the President. . . .

It was early determined that the present law should be administered by a system of supervised decentralization, retaining in the central office in Washington only sufficient control to insure promptness and uniformity of decision, and passing on to the states the complete responsibility. The success achieved surpassed expectations. With the intention of evolving the entire quota by the end of September, before which time it was then thought the cantonments would be ready to receive it, the boards proceeded to call and examine over 1,500,000 men. The first registrant was assimilated by the Army as early as July 30, 1917, and by Sept. 1, 1917, the local boards stood ready to deliver 180,000 men, the first 30 per cent. of the entire quota, to the cantonments. These boards were at all times prepared to furnish and did promptly supply men for every call that was made by the military authorities.

The experience of that first draft gave birth to new Selective Service Regulations, the two principal accomplishments of which were: first, the compilation of a scientific and complete inventory of our man power, including the qualifications and industrial and domestic circumstances of each registrant; second, the definite classification of all registrants into five classes according to their relative availability for military service with regard to their industrial, agricultural, and domestic importance to the nation. This definite classification and deferment of skilled, key, and pivotal men did much to dissipate previous unrest which was due to the lack of approximate knowledge of draft liability.

From the information thus obtained a complete central occupational card file was prepared in the office of the Provost Marshal General. This file contained the special occupational qualifications of each registrant, and served as a basis of information to the boards whenever a requisition for "men expert or highly skilled in any class of work" was made by the Adjutant General.

The *per capita* cost of the selective-service system, nationally, was as follows:

Cost per registrant	$0.54
Cost per man called	1.69
Cost per man accepted for service	4.93
Cost per man of quota due	7.59

Appropriations.—An idea of how the American people in industry fell in behind the Army with the elements of support may be gained from the War Department appropriations. For the year ending June 30, 1918, the amount of money necessary for the support of the military establishment aggregated $8,000,000,000; for the year ending June 30, 1919, the appropriations aggregated $15,300,000,000. Appropriations on the executive side of the War Department alone increased during the first year of war from $2,000,000 to $20,000,000, and the civilian employees from about 2,000 to more than 25,000. It has been estimated that more than 20,000,000 American citizens directly or indirectly engaged in some form of war industry, and of this number the vast majority contributed of their skill or brawn in support of the army.

Cantonments and Other Construction.—The first great military operation was the construction in this country of adequate cantonments and camps for the mobilization and initial training of the troops. In three months the Construction Division of the Quartermaster-General's Department built 16 cantonments, each one practically a city, comprising about 1,400 separate buildings and providing quarters for 47,000 men (*A. Y. B.*, 1917, p. 535). The organization formed to build cantonments proved the best instrument for the erection of storage depots, port terminals and hospitals. By Nov. 1, 1918, the original 16 projects had grown to 448, including only major undertakings. The number of commissioned officers had grown to 1,329 and civilian employees to 2,351; in addition, as many as 130,000 people were employed on construction projects under the direction of the Division. Allotments for all projects undertaken by the Construction Division amount to approximately $756,000,000. Some idea of the diversified nature of the work done can be gained from the following table, showing approximately the distribution of funds allotted to Nov. 1, 1918:

National Army cantonments	$208,000,000
National Guard camps	690,000,000
Other camps and cantonments	117,000,000
Regular Army posts	15,000,000
Coast Artillery posts	12,000,000
Hospitals	20,000,000
Quartermaster Corps projects	141,000,000
Ordnance Department projects	148,000,000
Signal Corps projects	2,000,000
Air Service projects	4,000,000
Other construction	20,000,000
Total	$756,000,000

The following is a list of the more important camps in the United States, with their locations and total capacities, permanent and emergency, as of Oct. 1, 1918:

NATIONAL ARMY CAMPS	Location	Total Capacity
Custer	Battle Creek, Mich.	35,458
Devens	Ayer, Mass.	36,832
Dodge	Des Moines, Iowa	54,227
Dix	Wrightstown, N. J.	64,806
Funston	Fort Riley, Kans.	50,806
Gordon	Atlanta, Ga.	41,162
Grant	Rockford, Ill.	42,819
Jackson	Columbia, S. C.	53,509
Lee	Petersburg, Va.	63,721
Lewis	American Lake, Wash.	46,232
Meade	Admiral, Md.	45,830
Pike	Little Rock, Ark.	53,843
Sherman	Chillicothe, Ohio	39,904
Taylor	Louisville, Ky.	66,424
Travis	Texas	42,809
Upton	Yaphank, L. I., N. Y.	54,065
NATIONAL GUARD CAMPS		
Beauregard	Alexandria, La.	29,121
Bowie	Fort Worth, Texas	41,879
Cody	Deming, N. M.	44,959
Doninhan	Fort Sill, Okla.	46,183
Fremont	California	30,000
Greene	Charlotte, N. C.	48,305
Hancock	Augusta, Ga.	45,099
Kearney	California	32,066
Logan	Houston, Texas	44,899
McArthur	Waco, Texas	45,074
McClellan	Anniston, Ala.	42,728
Sevier	Greenville, S. C.	30,428
Shelby	Hattiesburg, Miss.	36,010
Sheridan	Montgomery, Ala.	41,593
Wadsworth	Spartanburg, S. C.	56,249
Wheeler	Macon, Ga.	43,011
SPECIAL CAMPS AND CANTONMENTS		
Artillery		
Bragg	Fayetteville, N. C.	
Eustis, Abraham	Lee Hall, Va.	16,759
Knox	Stithton, Ky.	12,600
North Jackson	Columbia, S. C.	
Summerall	Tobyhanna, Pa.	
Chemical Warfare		
Kendric	Lakehurst, N. J.	1,500
Leach	Washington, D. C.	1,759
Willoughby	Willoughby, Ohio	
Engineers		
Forrest	Ft. Oglethorpe, Ga.	24,457
Humphreys	Accotink, Va.	19,637
Laurel	Laurel, Md.	
Infantry School of Arms		
Benning	Columbus, Ga.	1,064
Motor Transport		
Holabird	Baltimore, Md.	5,000
Jesup	Atlanta, Ga.	1,320
Normoyle	San Antonio, Texas	2,100
Ordnance		
Aberdeen	Aberdeen, Md.	5,000
Edgewood	Edgewood, Md.	8,000
Erie (Perry)	Port Clinton, Ohio	
Raritan River	Metuchen, N. J.	6,250
Signal Corps		
Franklin, Benj	Admiral, Md.	
Vail, Alfred	Little Silver, N. J.	750
Tank		
Colt	Gettysburg, Pa.	5,600
Polk	Raleigh, N. C.	

Special Camps and Cantonments—*Continued*	Location	Total Capacity
Quartermaster		
Johnston	Jacksonville, Fla	13,175
Meigs	Washington, D.C.	3,774
Ambulance		
Crane	Allentown, Pa	
Medical		
Greenleaf	Ft. Oglethorpe, Ga	12,999
Ft. Riley	Ft. Riley, Kans	
Embarkation		
Hill	Newport News, Va	5,852
Merritt	Dumont, N. J.	33,221
Mills	Mineola, L. I., N. Y.	35,000
Stuart	Newport News, Va	24,234
Limited Service		
Syracuse	Syracuse, N. Y.	7,400

Quartermaster Supplies.—On June 30, 1917, the Quartermaster Corps consisted of 1,124 commissioned officers, 8,446 enlisted men, and 20,500 civilian employees. By Oct. 15, 1918, the personnel of the Corps had been increased to 11,256 commissioned officers, 200,354 enlisted men, and 84,435 civilian employees. Some indication of the success with which the Quartermaster Corps met the situation is shown in the following table, which gives the amount and distribution of some of the important articles of clothing and subsistence on hand on Nov. 1, 1918:

	At and in Transit to Depots (000 omitted)	At and in Transit to Camps and Posts (000 omitted	At and in Transit to Embarkation Points (000 omitted)	In France and in Transit to France (000 omitted)	Total (000 omitted)
Clothing and equipage:					
Breeches and trousers, wool	3,389	1,653	1,749	1,349	8,140
Coats, wool	2,022	1,029	1,091	1,826	5,968
Undershirts, winter	6,159	4,120	3,526	4,177	17,982
Drawers, winter	8,359	4,356	3,031	5,808	21,554
Shoes, field and marching, pairs	4,500	2,524	1,825	1,926	10,775
Overcoats	1,888	1,446	357	384	4,075
Shirts, flannel	2,313	2,296	2,100	2,531	9,240
Stockings, wool, light and heavy, pairs	18,406	6,493	7,782	12,210	44,891
Subsistence:					
Meat ration	87,508	2,393	63,562	141,646	295,109
Flour ration	57,843	1,549	90,055	221,594	371,041
Bean ration	19,910	2,052	62,262	76,603	160,827
Vegetable ration	63,962	2,747	20,550	53,994	141,253
Fruit ration	24,993	2,040	5,079	11,469	43,581
Sugar ration	24,042	4,510	15,066	45,515	89,133
Milk, evaporated	37,816	2,539	19,326	18,010	77,691

The overseas shipments of clothing and equipage from March 31 to Oct. 31, 1918, were as follows:

	Number	Value
Blankets	2,592,000	$20,736,000
Breeches and trousers, wool	4,080,000	27,336,000
Coats, wool	3,353,000	32,825,870
Drawers, winter	9,679,000	19,358,000
Overcoats	1,321,000	16,076,570
Shirts, flannel	4,909,000	17,181,500
Shoes, field and march, pairs	8,439,000	48,554,150
Stockings, wool, light and heavy, pairs	26,501,000	11,925,450
Undershirts, winter	9,248,000	18,496,000

The overseas shipments of subsistence, forage, and fuel from April 1, 1917, to Nov. 10, 1918, were as follows:

	Quantity	Value
Subsistence:		
Flour	493,162,058	$26,926,648
Beef, fresh, frozen	213,034,473	50,553,080
Meats, canned	118,183,810	50,133,572
Bacon	115,415,372	49,086,157
Sugar	97,627,445	6,804,633
Beans, baked	54,496,008	4,986,385
Beans, dry	38,832,171	4,131,743
Tomatoes, canned	77,335,095	5,359,322
Prunes	13,709,341	1,218,760
Jam	24,723,283	1,285,415
Cigarettes, each	1,936,159,687	10,455,262
Milk, evaporated	39,918,202	3,975,853
Forage:		
Hay	273,704,000	3,831,856
Oats	535,852,000	13,396,300
Bran	44,546,000	668,190
Fuel:	*Gallons*	
Aviation gasoline	7,419,000	2,742,000
Motor gasoline	30,589,000	7,268,000

Embarkation. — During its 19 months of war the Army shipped overseas 2,075,834 men and 5,153,000 tons of cargo. In the last 10 of those months it embarked 1,880,339 men and shipped 4,660,000 tons of cargo. In May, 1917, the men sent across numbered 1,718; in June, 15,059; by the end of the year the rate had increased to 50,000 a month, and the total sent across at that date stood at 187,916 troops and 7,579 marines. In March, 1918, the dispatch of men numbered 84,863; in April, 118,637; in May, 245,950; in June, 278,750; in July, 306,185; and when the armistice was signed the total embarkations amounted to 2,045,169 troops and 30,665 marines—a performance unique in the world's history.

The first shipment of cargo to the A. E. F. was made in June, 1917, and amounted to 16,000 tons. In July, 1917, the total was 12,000 tons, and in August, 1917, it was 19,000 tons. By the fall of 1918 this movement had grown so that 750,000 tons were shipped in October. Of the men approximately half were carried in British ships, but of the cargo less than five per cent. was lifted by Allied ships. Of all the cargo shipped only 79,000 tons was lost at sea.

Among the articles shipped were ,145 consolidated hundred-ton locomotives, of which 350 were shipped set up on their own wheels so that they could be unloaded on the tracks in France and be under way in a few hours under their own steam. Shipment of set-up locomotives of this size had never been made before. When the armistice was signed, the Army was prepared to ship these set-up locomotives at the rate of 200 a month. The Army also shipped 17,000 standard-gauge freight cars, and when the fighting ceased was preparing to ship flat cars set up and ready to run. Motor trucks to the number of 34,433 had been sent across, and at the latest were being shipped at the rate of 10,000 a month. Rails and fittings amounting to 423,000 tons were sent over. In all the Army shipped 54,000 horses and mules, and at the cessation of hostilities was shipping them at the rate of 20,000 a month.

At the end of June, 1917, there were in service only seven troop ships with deadweight tonnage of 46,000 tons and six cargo ships with a deadweight tonnage of 48,000 tons. On Nov. 1, 1918, the American Army had in service 39 troop ships of 390,198 tons; 38 animal transports of 372,011 tons; 18 refrigerator ships of 92,542 tons; four tankers of 31,271 tons; and 228 cargo ships of 1,807,336 tons. In addition, General Pershing had gathered a cross-channel fleet which numbered 104 vessels and aggregated 331,087 tons. On Nov. 13, 1918, the Army had American shipping either in operation or under definite allocation totaling 3,800,000 deadweight tons, a fleet over twice as large as the entire American merchant marine engaged in foreign trade at the start of the war.

During the whole period of activities the Army lost at sea only 200,000 deadweight tons of transports. Of this total 142,000 tons were sunk by torpedoes. No American troop transport was lost on its eastward voyage. (See also *The Navy, infra.*)

Engineers.—The orders placed up to Nov. 19 for port development and railroad construction in France amounted to $700,000,000, a sum five times as great as all the purchases of material, equipment and supplies made for the Panama Canal. Of this sum about $400,000,000 went for American-built rolling stock, one-fourth of which had been shipped prior to the signing of the armistice. In addition, 209 locomotives had been purchased at the cost of $11,000,000 for Army use in this country. Up to Nov. 1 rails enough had been ordered to lay down in France 7,500 miles of track. Nearly half of this was already shipped abroad and the schedule of Nov. 11 called for the monthly shipment of material for about 600 miles of new track. In addition, 1,000 miles of narrow-gauge trackage was sent over for use behind the trenches. Sixty thousand men were organized into railway regiments for overseas service; among them were 28 locomotive engineers, 2,800 firemen, 200 conductors, and 5,700 brakemen. About 1,800 of these troops are officers. Practically all the timber used in this construction of lines of communication was secured from the forests of France and prepared by the 20th Engineers, which on Nov. 1 had 564 officers and 12,655 men.

In April, 1917, the Corps of Engineers numbered about 230 officers and 1,825 men; on Nov. 1, 1918, it comprised about 10,000 officers and 284,000 men organized into units for the following purposes: general construction, railway construction, road construction, dock construction, railway operations and maintenance, car and locomotive repair, electrical and mechanical work, quarrying, forestry, ship repair, water supply, sappers and pioneers.

Motor Transport. — The Motor Transport Corps consisted on Nov. 11, exclusive of the Motor and Vehicle Division, Q. M. C., of 2,700 officers and 77,000 enlisted men. The value of the automotive equipment carried from the fiscal year 1918 amounted to $353,000,000. For the fiscal year ending June 30, 1919, the appropriation for motor transportation was $886,000,000, of which $379,000,000 cannot be cancelled. To Nov. 11 there were completed for the Army 82,500 trucks, standardized and commercial types, 16,000 motor cars, 27,000 motorcycles, 22,000 bicycles, and a great number of trailers to be attached to the trucks. There were on hand overseas more than 55,000 motor vehicles; in October alone 17,500 were shipped, while there were available for shipment, on Nov. 1, 12,000 additional motor vehicles.

Munitions.—In the organization of munitions and supplies upward of 60,000 contracts were placed, requiring thousands of tons of raw material and employing hundreds of thousands of workmen. At the beginning of the war there were 225 officers in the Ordnance Department. By June 30, 1918, the number had increased to 4,618.

There were on hand at the beginning of the war nearly 600,000 Springfield rifles, with a productive capacity of 700 a day, and also several hundred thousand Krag-Jorgensens. A new rifle was designed, known as the model 1917 Enfield. In August, 1917, 2,000 of these new arms were produced; in September production was 12,000; in October, 62,000; in November, 87,000; in December, 123,203; in January, 1918, 130,319; in February, 161,448; in March, 197,756; in April, 151,616; in May, 202,376; in June, 184,379; in July, 196,831; in August, 235,900; in September, 181,950; in October, 207,247.

Production of the Browning machine gun began in March, 1918, that month yielding 558 of this type of weapon. In April the production was 12 heavies and 368 lights; in May, 922 heavies and 1,822 lights; in June, 2,620 heavies and 3,876 lights; in July, 4,225 heavies and 8,196 lights; in August, 9,182 heavies and 12,517 lights; in September, 8,838 heavies and 6,806 lights; in October, 13,747 heavies and 12,786 lights, or a total in eight months of 47,019. At the signing of the armistice the country possessed a stock of heavy Brownings sufficient to equip the A. E. F. twice over with a considerable margin and a stock of light Brownings sufficient to equip the A. E. F. on the original scale.

On April 6, 1917, the U. S. Army possessed no trench guns, no heavy artillery, and no railway guns. It had only 779 light and 114 medium guns, a total of 893 pieces. When the armistice was signed, the Army had 5,000 trench guns, 3,850 light guns, 1,070 medium guns, 695 heavy guns, and 19 railway guns, a total of 10,634 pieces, and contracts had been let for a total of 30,881 pieces. The production of artillery ammunition had increased to a point where the total weekly output of machine shells was nearly equal to that of Great Britain, and the delivery of complete rounds was 40 per cent. of the British rate. There was complete or in process of manufacture on Nov. 1, 1918, a total of 63,884,000 rounds. To carry through the production required new plants, and plant extensions to the value of about $400,000,000 had to be erected. The number of contracts placed during the fiscal year 1918 was approximately 16,000, of an aggregate of $5,000,000,000.

Air Service.—The Bureau of Aircraft Production was charged with the design, purchase, production and inspection of all material special to the Air Service (see also I, *War Organization*). There were produced in this country during the period of war in excess of 12,000 airplanes, 30,000 aviation motors and 700 kite balloons, together with a vast variety and quantity of accessories therefor (see also XVIII, *Manufactures*). In the production of airplanes the chief limiting factor was the possibility of engine production. The second limiting point was in the accessories, including instruments, armament, bombing equipment, radio equipment, photographic equipment, oxygen apparatus, and the special clothing and personal equipment of the aviator. The actual construction of the airplane was less difficult than that of the engines, as the investment in machinery and tools was much less, and the labor involved relatively less skilled.

The special raw materials for airplanes involved vast industrial operations.

It fell to the United States, for example, to supply the spruce for the entire air programme of the Allies and the United States. In October, 1917, these requirements were 5,000,000 ft. per month, with only 2,500,000 ft. per month being produced. In October, 1918, the requirements were 20,000,000 ft. per month with over 25,000,000 ft. being produced. These operations involved 30,000 men in the Northwest (see also XVI, *Forestry*). Early in the war, again, it was evident that the Irish supply of linen would fail. Cotton fabric for airplane use was developed in this country, and at the time of the signing of the armistice about 2,500 looms were producing about 1,200,000 yds. per month of airplane fabric. There had been delivered up to that date a total of over 13,000,000 yds. of airplane fabric.

Engine requirements fell into three classes—elementary training, advanced training, and combat planes. For elementary training there were available the Curtiss OX5 and the Hall-Scott A7A, and for advanced training the Gnome, the Le Rhone, and the Hispano-Suiza. Production of training-plane engines proceeded with comparatively little difficulty. For combat engines, however, it was clear that the only one available for our manufacturing purposes would be the Liberty, designed by E. J. Hall and J. G. Vincent in late May, 1917 (*A. Y. B.*, 1917, p. 549). The first contracts for the Liberty were placed in August, 1917. The Liberty 12-cylinder engine as originally designed was of the 300-h.p. class producing approximately 330 h.p. The Air Service had succeeded in getting tools and equipment to build this type and had produced approximately 300 of them, when it was advised by authorities in France that higher horsepower would be required. By readjustment of the parts the engineers stepped up the horse power of this engine to 375, with the result that certain of the parts would not stand this strain, and it was necessary to stop productive efforts and increase these parts to stand this additional power requirement. After several weeks' work this was accomplished and when approximately 500 had been produced the Service was again notified that a new increase in power would be required and that what would be needed for the summer of 1918 would be 400 h. p. or over. This again delayed production while the engineers rearranged the engine parts so that the engine would develop approximately 440 h. p. It became necessary to change the metallurgical specifications, which resulted in changes in the methods of the steel mills. In increasing the size of the parts all of the jigs, tools and fixtures in the machine plants, factories, forging shops, etc., were rendered obsolete and it was necessary to construct new equipment to meet all these conditions, in order to meet the requirements as given by aviation authorities in France. The extent and magnitude of the changes so required is illustrated by the fact that the engine when competent to develop 330 h. p. weighed 785 lb. without water or oil, while when it was competent to develop 440 h. p., it weighed 860 lb. In spite of this difficulty, on May 29, 1918, one year after the first scratch of the pencil toward the design of the engine was made, there had been produced and delivered into service 1,100 Liberty 12-cylinder engines. As to design there were but two changes in the engine since it was first laid out in May, 1917. One of these was to change the oil system from the so-called scupper feed. The other was an alteration in one part of the connecting rod to allow the rod to have sufficient play without cracking.

Real production of airplane engines

began in August, 1917. The following table shows the total production of engines by months from that date to the termination of hostilities:

1917		1918	
July	66	January	705
August	139	February	1,004
September	190	March	1,686
October	276	April	2,214
November	638	May	2,517
December	595	June	2,604
		July	3,151
		August	3,625
		September	3,801
		October	5,297
		November	3,305
		Total	31,813

The production of engines as to types is as follows:

OX5	8,412
Hispano-Suiza	4,101
Le Rhone	1,178
Lawrence	451
Gnome	280
A7A	2,250
Bugatti	11
Liberty	15,131
Total	31,814

The total amount of horsepower produced up to Nov. 22, 1918, was 7,804,414, of which the Liberty contributed 6,652,400.

Approximately 17,000 cadets were graduated from ground schools; 8,602 reserve military aviators were graduated from elementary training schools; and 4,028 aviators completed the course in advanced training provided in this country. The shortage of skilled mechanics with sufficient knowledge of airplanes and motors was met by the establishment of training schools from which over 14,000 mechanics were graduated. When the fighting ceased, there were in training as aviators in the United States 6,528 men, of whom 22 per cent. were in ground schools, 37 per cent. in elementary schools, and 41 per cent. in advanced training schools. The number of men in training as aviators' mechanics was 2,154. The first squadron of American aviators equipped with American planes and engines reached the front in the latter part of July, 1918. On Sept. 30, there were 32 squadrons at the front —15 pursuit, 13 observation, and four bombing. The reported battle fatalities in the Air Service up to Oct. 24, 1918, were 128, while accident fatalities overseas numbered 244. The fatalities at training fields in the United States up to Oct. 24, 1918, were 262.

On America's entrance into the war the personnel of the Air Service consisted of 65 officers and 1,120 men. When the armistice was signed, the total strength was slightly over 190,000, comprising about 20,000 commissioned officers, over 6,000 cadets under training, and 164,000 enlisted men. The Air Service constituted slightly over 5 per cent. of the total strength of the Army.

Signal Corps. — Every American division at the front included more than 500 men whose duty it was to set up and maintain lines and methods of communication. The Signal Corps organized behind the lines in France a complete telephone and telegraph system extending to stations in every area in which the American army was engaged. In addition, it laid solely for American use a four-conductor cable across the English Channel. At the outbreak of the war, it contained only 2,585 officers and men. When hostilities were suspended, it numbered more than 50,000 officers and men.

Chemical Warfare Service. — On June 28, 1918, there was created in the American army a Chemical Warfare Service (see also XXIII, *Industrial Chemistry*). On Nov. 1 the personnel included 1,654 commissioned officers and 18,027 enlisted men. At the signing of the armistice we were equipped to produce gases at a more rapid rate than France, England or Germany. An American type of gas mask was developed which afforded 20 times the protection of the German mask. Not a case is on record of an American soldier who has fallen victim of a gas attack when protected by the American mouthpiece type of mask. Production of gas masks started in July, 1917. To Nov. 9, 1918, the total production of all types was over five and a quarter millions, of which over four and a half millions were suitable for overseas use and nearly four million had been shipped to the American Expeditionary Forces. In October, 1918, 925,-

000 masks were completed and inspected. A monthly reduction of 1,200,000 was expected beginning in December, 1918.

Health of the Army.—For the year ended Aug. 30, 1918, the death rate from disease among troops in the United States was 6.4 per thousand; in the A. E. F., 4.7; for the combined forces, 5.9. The male civilian rate for the age group most nearly corresponding to the army age is substantially the same as the rate in the A. E. F. The death rate per thousand in the Union Army during the Civil War was 65, and in the American Army during the Spanish War, 26 per thousand.

In the United States at the signing of the armistice, there was hospital accommodation for 92,143 men standard capacity, or 120,816 in emergency. In the A. E. F. there were 104 base hospitals and 31 evacuation hospitals, giving a standard capacity of 143,420 beds or 220,204 emergency beds. During the war Army hospitals in the United States cared for 1,407,191 patients; those with the A. E. F. cared for 755,354.

On Nov. 11, 1918, there were 4,429 dentists in the Army and 5,372 in the Reserve Corps not yet called to active duty. When the armistice was signed, an adequate staff of nurses was on duty at every army hospital in the United States; 8,510 were on duty in Europe; 1,400 were mobilized and awaiting transportation overseas; and 2,000 more were available for immediate foreign service.

At the beginning of the war, there were only 750 officers, 393 nurses, and 6,619 enlisted men belonging to the Medical Department. In November, 1918, the corresponding figures were 3,936 officers, 21,344 nurses, and 245,652 enlisted men.

Operations of the American Expeditionary Force.—General Pershing and his small staff arrived in Paris on June 14, 1917, 69 days after the declaration of war. American troops first arrived in France on June 26. On Oct. 10, 187 days after the declaration of war, American soldiers went over the top, and in January, 1918, they took over permanently a part of the line as an American sector.

The following excerpts from the preliminary report of General Pershing to the Secretary of War, under date of Nov. 20, 1918, give a striking summary of the operations of the American Expeditionary Force (see also III, *The European War*):

> Pursuant to your instructions, immediately upon receiving my orders I selected a small staff and proceeded to Europe in order to become familiar with conditions at the earliest possible moment.
>
> The warmth of our reception in England and France was only equaled by the readiness of the commanders in chief of the veteran armies of the Allies and their staffs to place their experience at our disposal. In consultation with them the most effective means of coöperation of effort was considered. With French and British armies at their maximum strength, and all efforts to dispose the enemy from his firmly intrenched positions in Belgium and France failed, it was necessary to plan for an American force adequate to turn the scale in favor of the Allies. Taking account of the strength of the Central Powers at that time, the immensity of the problem which confronted us could hardly be overestimated. The first requisite being an organization that could give intelligent direction to effort, the formation of a general staff occupied my early attention. . . .
>
> As models to aid us we had the veteran French General Staff and the experience of the British who had similarly formed an organization to meet the demands of a great army. By selecting from each the features best adapted our basic organization, and fortified by our own early experience in the war, the developments of our great General Staff system was completed. . . .
>
> After a thorough consideration of Allied organizations it was decided that our combat division should consist of four regiments of infantry of 3,000 men, with three battalions to a regiment and four companies of 250 men each to a battalion, and of an artillery brigade of three regiments, a machine-gun battalion, an engineer regiment, a trench-mortar battery, a signal battalion, wagon trains, and the headquarters staffs and military police. These, with medical and other units, made a total of over 28,000 men, or practically double the size of a French or German division. Each corps would normally consist of six divisions—four combat and one depot and one replacement division—and also two regiments of cavalry, and each army of from three to five corps. With four divisions fully trained, a corps could take over an American sector with two divisions in line and two in reserve, with the depot and replacement divisions prepared to fill the gaps in the ranks. . . .
>
> On March 28, I placed at the disposal of Marshal Foch, who had been agreed upon as Commander in Chief of the Allied Armies, all of our forces to be used as he might decide. At his request the

first division was transferred from the Toul sector to a position in reserve at Chaumont-en-Vexin. . . .

On April 26 the first division had gone into the line in the Montdidier salient on the Picardy battle front. Tactics had been suddenly revolutionized to those of open warfare, and our men, confident of the results of their training, were eager for the test. On the morning of May 28 this division attacked the commanding German position in its front, taking with splendid dash the town of Cantigny and all other objectives, which were organized and held steadfastly against vicious counter attacks and galling artillery fire. . . .

The Germans' Aisne offensive, which began on May 27, had advanced rapidly toward the River Marne and Paris, and the Allies faced a crisis equally as grave as that of the Picardy offensive in March. Again every available man was placed at Marshal Foch's disposal, and the third division, which had just come from its preliminary training in the trenches, was hurried to the Marne. Its motorized machine-gun battalion preceded the other units and successfully held the bridgehead at the Marne, opposite Château-Thierry. The second division, in reserve near Montdidier, was sent by motor trucks and other available transport to check the progress of the enemy toward Paris. The division attacked and retook the town and railroad station at Bouresches and sturdily held its ground against the enemy's best guard divisions. In the battle of Belleau Wood, which followed, our men proved their superiority and gained a strong tactical position, with far greater loss to the enemy than to ourselves. On July 1, before the second was relieved, it captured the village of Vaux with most splendid precision. . . .

The great June-July troop movement from the States was well under way, and, although these troops were to be given some preliminary training before being put into action, their very presence warranted the use of all the older divisions in the confidence that we did not lack reserves. Elements of the Forty-second Division were in the line east of Rheims against the German offensive of July 15, and held their ground unflinchingly. On the right flank of this offensive four companies of the Twenty-eighth Division were in position in face of the advancing waves of the German infantry. The Third Division was holding the bank of the Marne from the bend east of the mouth of the Surmelin to the west of Mézy, opposite Château-Thierry, where a large force of German infantry sought to force a passage under support of powerful artillery concentrations and under cover of smoke screens. A single regiment of the Third wrote one of the most brilliant pages in our military annals on this occasion. It prevented the crossing at certain points on its front while, on either flank, the Germans, who had gained a footing, pressed forward. Our men, firing in three directions, met the German attacks with counterattacks at critical points and succeeded in throwing two German divisions into complete confusion, capturing 600 prisoners.

The great force of the German Château-Thierry offensive established the deep Marne salient, but the enemy was taking chances, and the vulnerability of this pocket to attack might be turned to his disadvantage. Seizing this opportunity to support my conviction, every division with any sort of training was made available for use in a counteroffensive. The place of honor in the thrust toward Soissons on July 18 was given to our First and Second Divisions in company with chosen French divisions. Without the usual brief warning of a preliminary bombardment, the massed French and American artillery, firing by the map, laid down its rolling barrage at dawn while the infantry began its charge. The tactical handling of our troops under these trying conditions was excellent throughout the action. The enemy brought up large numbers of reserves and made a stubborn defense both with machine guns and artillery, but through five days' fighting the First Division continued to advance until it had gained the heights above Soissons and captured the village of Berzy-le-Sec. The Second Division took Beau Repaire farm and Vierzy in a very rapid advance and reached a position in front of Tigny at the end of its second day. These two divisions captured 7,000 prisoners and over 100 pieces of artillery.

The Twenty-sixth Division, which, with a French division, was under command of our First Corps, acted as a pivot of the movement toward Soissons. On the 18th it took the village of Torcy while the Third Division was crossing the Marne in pursuit of the retiring enemy. The Twenty-sixth attacked again on the 21st, and the enemy withdrew past the Château-Thierry-Soissons road. The Third Division, continuing its progress, took the heights of Mont St. Pierre and the villages of Chartrèves and Jaulgonne in the face of both machine-gun and artillery fire.

On the 24th, after the Germans had fallen back from Trugny and Epieds, our Forty-second Division, which had been brought over from the Champagne, relieved the Twenty-sixth and, fighting its way through the Forêt de Fère, overwhelmed the nest of machine guns in its path. By the 27th it had reached the Ourcq, whence the Third and Fourth Divisions were already advancing, while the French division with which we were coöperating were moving forward at other points.

The Third Division had made its advance into Roncheres wood on the 29th and was relieved for rest by a brigade of the Thirty-second. The Forty-second and Thirty-second undertook the task of conquering the heights beyond Cierges, the Forty-second capturing Sergy and the Thirty-second capturing Hill 230, both American divisions joining in the pursuit of the enemy to the Vesle, and thus the operation of reducing the salient was finished. Meanwhile the Forty-second was relieved by the Fourth at

Chéry-Chartreuve, and the Thirty-second by the Twenty-eighth, while the Seventy-seventh Division took up a position on the Vesle. The operations of these divisions on the Vesle were under the Third Corps, Maj. Gen. Robert L. Bullard, commanding.

With the reduction of the Marne salient we could look forward to the concentration of our divisions in our own zone. In view of the forthcoming operation against the St. Mihiel salient, which had long been planned as our first offensive action on a large scale, the First Army was organized on August 10 under my personal command. While American units had held different divisional and corps sectors along the western front, there had not been up to this time, for obvious reasons, a distinct American sector; but, in view of the important parts the American forces were now to play, it was necessary to take over a permanent portion of the line. Accordingly, on August 30, the line beginning at Port sur Seille, east of the Moselle and extending to the west through St. Mihiel, thence north to a point opposite Verdun, was placed under my command. The American sector was afterwards extended across the Meuse to the western edge of the Argonne Forest, and included the Second Colonial French, which held the point of the salient, and the Seventeenth French Corps, which occupied the heights above Verdun.

The preparation for a complicated operation against the formidable defenses in front of us included the assembling of divisions and of corps and army artillery, transport, aircraft, tanks, ambulances, the location of hospitals, and the molding together of all of the elements of a great modern army with its own railheads, supplied directly by our own service of supply. The concentration for this operation, which was to be a surprise, involved the movement, mostly at night, of approximately 600,000 troops, and required for its success the most careful attention of every detail. . . .

After four hours artillery preparation, the seven American divisions in the front line advanced at 5 a. m. on September 12, assisted by a limited number of tanks manned partly by Americans and partly by the French. These divisions, accompanied by groups of wire cutters and others armed with bangalore torpedoes, went through the successive bands of barbed wire that protected the enemy's front line and support trenches in irresistible waves on schedule time, breaking down all defense of an enemy demoralized by the great volume of our artillery fire and our sudden approach out of the fog.

Our First Corps advanced to Thiaucourt, while our Fourth Corps curved back to the southwest through Nonsard. The Second Colonial French Corps made the slight advance required of it on very difficult ground, and the Fifth Corps took its three ridges and repulsed a counter attack. A rapid march brought reserve regiments of a division of the Fifth Corps in Vigneulles in the early morning, where it linked up with patrols of our Fourth Corps, closing the salient and forming a new line west of Thiaucourt to Vigneulles and beyond Fresnes-en-Woevre. At the cost of only 7,000 casualties, mostly light, we had taken 16,000 prisoners and 443 guns, a great quantity of material, released the inhabitants of many villages from enemy domination, and established our lines in a position to threaten Metz. This signal success of the American First Army in its first offensive was of prime importance. The Allies found they had a formidable army to aid them, and the enemy learned finally that he had one to reckon with.

On the day after we had taken the St. Mihiel salient, much of our corps and army artillery which had operated at St. Mihiel, and our divisions in reserve at other points, were already on the move toward the area back of the line between the Meuse River and the western edge of the forest of Argonne. . . .

On the night of September 25 our troops quietly took the place of the French and thinly held the line in this sector which had long been inactive. In the attack which began on the 25th we drove through the barbed wire entanglements and the sea of shell craters across No Man's Land, mastering all the first-line defenses. Continuing on the 27th and 28th, against machine guns and artillery of an increasing number of enemy reserve divisions, we penetrated to a depth of from three to seven miles, and took the village of Montfaucon and its commanding hill and Exermont, Gercourt, Cuisy, Septsarges, Malancourt, Ivoiry, Epinonville, Charpentry, Very, and other villages. East of the Meuse one of our divisions, which was with the Second Colonial French Corps, captured Marcheville and Rieville, giving further protection to the flank of our main body. We had taken 10,000 prisoners, we had gained our point of forcing the battle into the open and were prepared for the enemy's reaction, which was bound to come as he had good roads and ample railroad facilities for bringing up his artillery and reserves.

In the chill rain of dark nights our engineers had to build new roads across spongy, shell-torn areas, repair broken roads beyond No Man's Land, and build bridges. Our gunners, with no thought of sleep, put their shoulders to wheels and dragropes to bring their guns through the mire in support of the infantry, now under the increasing fire of the enemy's artillery. Our attack had taken the enemy by surprise, but, quickly recovering himself, he began to fire counterattacks in strong force, supported by heavy bombardments, with large quantities of gas. From September 28 until October 4 we maintained the offensive against patches of woods defended by snipers and continuous lines of machine guns, and pushed forward our guns and transport, seizing strategical points in preparation for further attacks.

Other divisions attached to the allied armies were doing their part. It was the fortune of our Second Corps, composed of the Twenty-seventh and Thirtieth Divisions, which had remained with the British, to have a place of honor in coöperation with the Australian Corps on September 29 and October 1 in the assault on the Hindenburg line where the St. Quentin Canal passes through a tunnel under a ridge. The Thirtieth Division speedily broke through the main line of defense for all its objectives, while the Twenty-seventh pushed on impetuously through the main line until some of its elements reached Gouy. In the midst of the maze of trenches and shell craters and under cross fire from machine guns the other elements fought desperately against odds. In this and in later actions, from October 6 to October 19, our Second Corps captured over 6,000 prisoners and advanced over 13 miles. The spirit and aggressiveness of these divisions have been highly praised by the British army commander under whom they served.

On October 2-9 our Second and Thirty-sixth Divisions were sent to assist the French in an important attack against the old German positions before Rheims. The Second conquered the complicated defense works on their front against a persistent defense worthy of the grimmest period of trench warfare and attacked the strongly held wooded hill of Blanc Mont, which they captured in a second assault, sweeping over it with consummate dash and skill. This division then repulsed strong counter attacks before the village and cemetery of Ste. Etienne and took the town, forcing the Germans to fall back from before Rheims and yield positions they had held since September, 1914. On October 9 the Thirty-sixth Division relieved the Second and, in its first experience under fire, withstood very severe artillery bombardment and rapidly took up the pursuit of the enemy, now retiring behind the Aisne.

The allied progress elsewhere cheered the efforts of our men in this crucial contest as the German command threw in more and more first-class troops to stop our advance. We made steady headway in the almost impenetrable and strongly held Argonne Forest, for, despite this reinforcement, it was our army that was doing the driving. Our aircraft was increasing in skill and numbers and forcing the issue, and our infantry and artillery were improving rapidly with each new experience. The replacements fresh from home were put into exhausted divisions with little time for training, but they had the advantage of serving beside men who knew their business and who had almost become veterans overnight. The enemy had taken every advantage of the terrain, which especially favored the defense, by a prodigal use of machine guns manned by highly trained veterans and by using his artillery at short ranges. In the face of such strong frontal positions we should have been unable to accomplish any progress according to previously accepted standards, but I had every confidence in our aggressive tactics and the courage of our troops.

On October 4 the attack was renewed all along our front. The Third Corps tilting to the left followed the Brieulles-Cunel road; our Fifth Corps took Gespes, while the First Corps advanced for over two miles along the irregular valley of the Aire River and in the wooded hills of the Argonne that bordered the river, used by the enemy with all his art and weapons of defense. This sort of fighting continued against an enemy striving to hold every foot of ground and whose very strong counterattacks challenged us at every point. On the 7th the First Corps captured Chatel-Chéhéry and continued along the river to Cornay. On the east of Meuse sector one of the two divisions coöperating with the French captured Consenvoye and the Haumont Woods. On the 9th the Fifth Corps, in its progress up the Aire, took Fléville, and the Third Corps which had continuous fighting against odds was working its way through Brieulles and Cunel. On the 10th we had cleared the Argonne Forest of the enemy.

It was now necessary to constitute a second army, and on October 9 the immediate command of the First Army was turned over to Lieut. Gen. Hunter Liggett. The command of the Second Army, whose divisions occupied a sector in the Woevre, was given to Lieut. Gen. Robert L. Bullard, who had been commander of the First Division and then of the Third Corps. . . .

Our constant pressure against the enemy brought day by day more prisoners, mostly survivors from machine-gun nests captured in fighting at close quarters. On October 18 there was very fierce fighting in the Caures Woods east of the Meuse and in the Ormont Woods. On the 14th the First Corps took St. Jauvin, and the Fifth Corps, in hand-to-hand encounters, entered the formidable Kriemhilde line, where the enemy had hoped to check us indefinitely. Later the Fifth Corps penetrated further the Kriemhilde line, and the First Corps took Champigneulles and the important town of Grandpré. Our dogged offensive was wearing down the enemy, who continued desperately to throw his best troops against us, thus weakening his line in front of our allies and making their advance less difficult.

Meanwhile we were not only able to continue the battle, but our Thirty-seventh and Ninety-first Divisions were hastily withdrawn from our front and dispatched to help the French Army in Belgium. Detraining in the neighborhood of Ypres, these divisions advanced by rapid stages to the fighting line and were assigned to adjacent French corps. On October 31, in continuation of the Flanders offensive, they attacked and methodically broke down all enemy resistance. On November 3 the Thirty-seventh had completed its mission in dividing the enemy across the Escaut River and firmly established itself along the east bank included in the division zone of action. By a clever flanking movement troops of the Ninety-first Division captured Spitaals Bosschen, a difficult wood extending across the central part of the division sector, reached the Scheldt, and penetrated into the town of Audenarde. These divisions received high commendation from their corps commanders for their dash and energy.

On the 23d the Third and Fifth Corps pushed northward to the level of Bantheville. While we continued to press forward and throw back the enemy's violent counterattacks with great loss to him, a regrouping of our forces was under way for the final assault. Evidences of loss of morale by the enemy gave our men more confidence in attack and more fortitude in enduring the fatigue of incessant effort and the hardships of very inclement weather.

With comparatively well-rested divisions, the final advance in the Meuse-Argonne front was begun on November 1. Our increased artillery force acquitted itself magnificently in support of the advance, and the enemy broke before the determined infantry, which, by its persistent fighting of the past weeks and the dash of this attack, had overcome his will to resist. The Third Corps took Aincreville, Doulcon, and Andevanne, and the Fifth Corps took Landres et St. Georges and pressed through successive lines of resistance to Bayonville and Chennery. On the 2d the First Corps joined in the movement, which now became an impetuous onslaught that could not be stayed.

On the 3d advance troops were surged forward in pursuit, some by motor trucks, while the Artillery pressed along the country roads close behind. The First Corps reached Authe and Châtillon-Sur-Dar, the Fifth Corps, Fosse and Nouart, and the Third Corps, Halles penetrated the enemy's line to a depth of 12 miles. Our large caliber guns had advanced and were skillfully brought into position to fire upon the important lines at Montmedy, Longuyon, and Conflans. Our Third Corps crossed the Meuse on the 5th and the other corps, in the full confidence that the day was theirs, eagerly cleared the way of machine guns as they swept northward, maintaining complete coördination throughout. On the 6th, a division of the First Corps reached a point on the Meuse opposite Sedan, 25 miles from our line of departure. The strategical goal which was our highest hope was gained. We had cut the enemy's main line of communications, and nothing but surrender or an armistice could save his army from complete disaster.

In all 40 enemy divisions had been used against us in the Meuse-Argonne battle. Between September 26 and November 6 we took 26,059 prisoners and 468 guns on this front. Our divisions engaged were the First, Second, Third, and Fourth, Fifth, Twenty-sixth, Twenty-eighth, Twenty-ninth, Thirty-second, Thirty-third, Thirty-fifth, Thirty-seventh, Forty-second, Seventy-seventh, Seventy-eighth, Seventy-ninth, Eightieth, Eighty-second, Eighty-ninth, Ninetieth, and Ninety-first. Many of our divisions remained in line for a length of time that required nerves of steel, while others were sent in again after only a few days of rest. The First, Fifth, Twenty-sixth, Forty-second, Seventy-seventh, Eightieth, Eighty-ninth, and Ninetieth were in the line twice. Although some of the divisions were fighting their first battle, they soon became equal to the best.

On the three days preceding November 10, the Third, the Second Colonial, and the Seventeenth French Corps fought a difficult struggle through the Meuse Hills south of Stenay and forced the enemy into the plain. Meanwhile, my plans for further use of the American forces contemplated an advance between the Meuse and the Moselle in the direction of Longwy by the First Army, while, at the same time, the Second Army should assume the offensive toward the rich coal fields of Briey. These operations were to be followed by an offensive toward Château-Salins east of the Moselle, thus isolating Metz. Accordingly, attacks on the American front had been ordered and that of the Second Army was in progress on the morning of November 11, when instructions were received that hostilities should cease at 11 o'clock a. m.

At this moment the line of the American sector, from right to left, began at Port-sur-Seille, thence across the Moselle to Vandières and through the Woevre to Bezonvaux in the foothills of the Meuse, thence along to the foothills and through the northern edge of the Woevre forests to the Meuse at Mouzay, thence along the Meuse connecting with the French under Sedan. . . .

There are in Europe altogether . . . including those *en route* from the States, approximately 2,053,347 men, less our losses. Of this total there are in France 1,338,169 combatant troops. Forty divisions have arrived, of which the infantry personnel of 10 have been used as replacements. . . .

I pay the supreme tribute to our officers and soldiers of the line. When I think of their heroism, their patience under hardships, their unflinching spirit of offensive action, I am filled with emotion which I am unable to express. Their deeds are immortal, and they have earned the eternal gratitude of our country.

Casualties. — Casualties reported from the American Expeditionary Forces up to and including Nov. 26, 1918, were:

Killed in action	28,363
Died of wounds	12,101
Died of disease	16,034
Died of other causes	1,980
Missing in action	14,260
Prisoners	2,163
Wounded (severely)	54,751
Wounded (degree undetermined)	43,168
Wounded (slightly)	92,036
Total	264,856

XI. MILITARY AND NAVAL

THE NAVY

John Wilber Jenkins

Growth During the War.—When the armistice with Germany was signed, on Nov. 11, 1918, there were 2,003 vessels in the service of the Navy, and a total personnel of 540,059—507,607 enlisted men and 32,452 officers. On April 6, 1917, the day the United States declared a state of war, there were 364 vessels on the navy list, 20 of which were unserviceable for war purposes, and the regular Navy comprised 64,680 enlisted men and 4,376 officers. This large increase in the number of vessels and 461,000 in personnel measures the growth of the service in the war period. Secretary Daniels' report for 1917 showed a total of 245,207 (166,939 men and 6,912 officers) in the regular Navy; 54,000 in the Reserve Force; 16,500 men and 856 officers in the National Naval Volunteers. Thus the personnel of the Navy was more than doubled in the year 1918. The Marine Corps, which on April 6, 1917, had but 13,266 enlisted men and 426 officers, grew to a total strength of 72,962—70,527 men and 2,435 officers. The Coast Guard, which has operated under the Navy for the period of the war, now comprises 5,705 enlisted men, 236 commissioned officers, 35 cadets, and 452 warrant officers. So the total number of officers and men in service at the highest point of the war period was no less than 619,449. In addition, there were some 80,000 workmen employed in navy yards and stations, and several thousand other civilian employees of the Navy Department, bringing the list to a grand total of more than 700,000 persons under the naval establishment.

Secretary Daniels' New Programme.—Although this marks the highest point in size of personnel, as immediately after the suspension of hostilities it was announced that at least 20 per cent. of the men in service would be released from active duty, the naval authorities are confident that the United States will maintain a large and powerful navy, and will continue the construction policy begun in 1916 (*A. Y. B.*, 1916, p. 320). Secretary Daniels has urged Congress to authorize a second three-year programme as large as that authorized in 1916 (*A. Y. B.*, 1917, p. 296), comprising 156 vessels. This includes, as did the first three-year programme, 10 battleships and six battle cruisers, but as regards the smaller vessels it is asked that they be "of types already approved and in existence or of new types which may develop during the life of the programme," the details to be left to the discretion of the Navy Department. In announcing this programme Secretary Daniels said:

> The new three-year programme is a continuation of the policy adopted in 1916 of increasing the Navy, and contemplates its steady upbuilding and improvement. It is in line with the policy adopted by this Government, and which has met with the entire approval of the American people, of building up a Navy strong enough to meet all requirements.
>
> This programme, if authorized by Congress, as I am confident it will be, will give us 16 additional capital ships which will be the equal of any afloat at the time they are built. The battleships and battle cruisers authorized in the first three-year programme will be unexcelled by those of any other navy, and the country may rest assured that, in the new construction authorized, our constructors will produce the most powerful and effective of fighting craft.

In urging the new three-year programme, the Secretary said to the House Committee on Naval Affairs:

> It is our duty to consider the obligations imposed upon America if the Peace Conference now occupied at Versailles upon the greatest task which ever engaged the attention of a human gathering during the whole course of the world's history completes its work constructively and satisfactorily, as we all hope it will do. Let us assume that this Conference will give birth to some plan looking toward a concert of the nations for the maintenance of peace, whether it be a League of Nations, according to the present acceptation of the meaning of that term, or what not. It will be some manner of body to which differing nations will perforce submit their differences for adjudication and which will be sufficiently powerful to induce acceptance of its decisions when once they shall be made. . . .
>
> I am quite certain that it would be improper for America even to consider the proposition of contributing to the world police a number of units smaller than that contributed by the greatest other power. It seems to me that this is obviously the American duty and that

the other nations of the world would be justified in regarding us as shirkers if we failed to accept the burden of it cheerfully and turn to the performance of it with an unexampled earnestness and high efficiency. It would be contrary to all our traditions and all our ideals to assume that in the planning of a new and mighty Navy, America could be animated either by fear or by the intention of aggression.

What if, unhappily, the Peace Conference should fail to come to an agreement upon such a plan? Suppose the Powers do not now agree to curtail armament. Then it is entirely obvious to all that the United States, if she is to realize her destiny as a leader of the democratic impulse, if she is to play her proper part (as she, hand in hand with her incomparable Allies, has played it in this war) in the protection of small nations, the preservation of the freedom of the seas for them and for the world at large, must have a Navy that will be as powerful as that of any nation in the world.

The Secretary reduced his estimate of $200,000,000 for the new building programme for the year beginning July, 1919, to $55,000,000. In addition he submitted other revised estimates, cutting the total asked for the Navy during the fiscal year 1920 from $2,664,307,000 to $975,903,621. The earlier estimate was drawn up while the war was in progress.

Strength of the Leading Navies.—Secretary Daniels revealed to the House Committee the strength of the five leading navies, in ships built, building, and authorized, according to the latest information available up to Dec. 30, 1918, as follows:

	Great Britain		United States		Germany		Japan		France	
	Number	Tons	Number	Tons	Number	Tons	Number	Tons	Number	Tons
Battleships....	55	1,103,900	36	680,337	30	464,777	13	273,427	18	338,976
Battle cruisers.	9	205,500	.....	....	1	27,000	7	152,950	.....	....
Cruisers.......	24	300,150	8	111,900	29	127,629	12	113,242	18	185,957
Light cruisers..	73	296,045	13	55,160	.....	....	9	34,845	1	2,421
Coast defense vessels......	32	8,590	4	12,900	.....	....	.....	....	.....	....
Torpedo boat destroyers...	369	350,020	105	109,060	173	41,800	65	37,177	65	37,505
Torpedo boats.	34	9,576	.....	....	101	18,857	24	2,984	79	7,312
Submarines....	140	(1)	84	32,176	116	116,545	16	3,414	58	22,026
Total.....	736	2,273,781	259	1,001,533	450	826,637	146	618,039	239	594,197
Building and projected, 1919										
Battleships....	.....	....	13	485,600	[2] 2	56,000	[3] 4	128,000	5 4	124,150 [4] 83,600
Battle cruisers.	4	164,800	[4] 6	211,416	[5] 3	....	.....	....	.....	....
Cruisers.......	.....	....	9	63,900	[6] 4	16,000	.....	....	.....	....
Light cruisers..	21	125,235	.....	....	[5] 4	....	7	24,500	.....	....
Torpedo-boat destroyers...	115	141,855	238	286,779	.....	....	9 14	11,700 (7)	1	890
Torpedo boats.	.....	....	.....	....	.....	....	.....	....	.....	....
Submarines....	79	66,871	[8] 83	68,694	.....	24,800	4 6	3,000 (1)	8	(1)
Total.....	219	498,761	349	1,116,389	13	96,800	24	167,200	14	125,040

[1] Unknown.
[2] 4 authorized, not laid down.
[3] 1 laid down.
[4] Not laid down.
[5] Laid down; tonnage unknown.
[6] 4 mine-laying cruisers laid down.
[7] Tonnage unknown.
[8] Including 9 not laid down.

NOTE.—Battleships, battle cruisers, cruisers, light cruisers, and coast defense vessels over 20 years of age not included. Torpedo-boat destroyers, torpedo boats, and submarines over 15 years of age not included.

German vessels surrendered to the allies not included in the above compilation. Russian vessels in the hands of the Germans not included in German figures.

While Germany ranks third according to tonnage, her real position, according to fighting ships and gun power, is fifth.

Following is the list of German naval vessels actually surrendered to and including December 9, 1918:

BATTLESHIPS.—*Bayern, Kronprinz Wilhelm, Markgraf, Grosser Kurfürst, König, König Albert, Prinzregent Luitpold, Kaiserin, Frederick Der Grosse, Kaiser;* total, 10.

BATTLE CRUISERS.—*Hindenburg, Derfflinger, Seydlitz, Moltke, Von Der Tann;* total, 5.

LIGHT CRUISERS.—*Dresden, Nürnberg,*

Karlsruhe, Emdem, Frankfurt, Coln; total, 6.

MINE-LAYING CRUISERS. — *Brummer, Bremse;* total, 2.

DESTROYERS.—Total, 50.

SUBMARINES.—Total, 121.

German Submarines. — Regarding submarine craft, Admiral Badger said that on Aug. 1, 1918, the estimated number of German submarines was: total number built, 331; number sunk, 158; number available, 173. Of the 173, 26 were school boats and 147 for operation at sea, 28 in the Mediterranean and 119 in the Atlantic. This estimate proved too high, as Germany did not have the 160 submarines demanded in the original terms of the armistice. It was figured that she had only approximately 135. Of these 122 had been surrendered up to Dec. 9. Figures compiled later by the British Admiralty indicated that 202 German submarines were captured or destroyed by the Allies, 14 were destroyed by the Germans themselves, 122 were surrendered, and 170 more were building in German shipyards.

The Austrians had only 35 submarines, of which 10 were obsolete. Seven were sunk, and but 18 were available for service, all operating in the Adriatic and Mediterranean.

The Allies, Admiral Badger said, had 5,556 anti-submarine craft, operating in the Atlantic, the Mediterranean, and other European waters. These include destroyers and all types of craft, large and small, used in the warfare against the submarines.

American Ships in Service.—It was announced that at the time the armistice was signed there were 2,003 vessels manned and operated by the United States Navy. The detailed statement of November 1, 1918, showed 1,990 in service. The regular naval vessels were:

Battleships	40
Cruisers	32
Monitors	8
Gunboats	33
Destroyers	125
Torpedo boats	17
Submarines	68
Submarine chasers	303
Tenders to destroyers and submarines	15
Mine planters and sweepers	79
Yachts on patrol duty	56
Tugs on patrol duty	53
Supply vessels, Navy	51
Transports, Navy	4
Hospital ships	3

In addition to the above the Navy was manning at that time:

Troop transports	50
Cargo transports	232
Patrol vessels in the districts	640
Barges in the districts	175

On April 6, 1917, there were 364 vessels on the Navy list, 20 of which were listed as "unserviceable for war purposes."

Construction in 1918.—During the year 1918 attention was necessarily concentrated largely on the production of destroyers and other craft to combat the submarine, but the Naval Appropriation Act of July 1, 1918, provided that all the capital ships authorized in the 1916 programme should be laid down before July 1, 1919, and Secretary Daniels announced that work would be pushed on battleships and battle cruisers, and that they would be built as rapidly as was "humanly possible." During the fiscal year contracts were awarded for four battleships, one battle cruiser, two fuel ships, one transport, one gunboat, one ammunition ship, 223 destroyers, 58 submarines, 112 fabricated patrol vessels (including 12 for the Italian Government), 92 submarine chasers (including 50 for the French Government), 51 minesweepers, 25 seagoing tugs, 46 harbor tugs, a large number of lighters, barges and other auxiliary harbor craft; in addition contracts were placed for 12 large fuel ships in conjunction with the Emergency Fleet Corporation. Up to Oct. 1, 1918, there had been launched 155 ships, in the first nine months of the year no less than 83 destroyers of 98,281 tons aggregate normal displacement being launched, as compared with 62 destroyers of 58,285 tons during the nine years preceding 1918. New records have been made in destroyer construction. At the Mare Island (Cal.) Navy Yard the destroyer *Ward* was launched 17½ days after the keel was laid, and the vessel was put in commission in 70 days. This was, of course, what shipbuilders call a "stunt," but a number have been completed in six to seven months.

In the two years, 1917 and 1918, the Navy either built or contracted for nearly 300 destroyers. To build this immense fleet new yards were created and old ones extended. The largest destroyer-building plant in existence was erected at Squantum, Mass.; the keels of five destroyers were laid on one day in April in this plant, which was begun in the previous October. Fourteen destroyers were launched on July 4, eight of these at the Union Plant of the Bethlehem Shipbuilding Corporation, at San Francisco. Destroyer design has been standardized, the flush-deck type, with a speed of 35 knots and engines of 28,000 h. p., being adopted.

Two new superdreadnaughts, the *New Mexico* and the *Mississippi*, each of 32,000 tons displacement, have been completed and put in commission. These are the largest battleships in service in any navy. The *Idaho* will be commissioned early in 1919, and the *Tennessee* and *California* are nearing completion.

A new type of anti-submarine craft, known as the "Eagle" class, was designed and built in the Ford automobile plant, Detroit. The first keel was laid in February, and the first of the boats, of which 100 were contracted for, were being delivered, completed, by autumn. These boats are of steel, 200 ft. long, and possess many of the characteristics of destroyers, but not their speed, making only 18 knots.

Operations in Foreign Waters.—Operations in 1918 embraced the widest scope in the history of the Navy, extending from the White Sea and the Murman Coast to the Adriatic, covering the entire Atlantic, and extending in the Pacific from our own west coast to Vladivostok. The force operating in European waters, under command of Admiral Sims, grew to 318 vessels and 75,000 officers and men, more than were in the entire Navy when we entered the war. The force of destroyers operating from the base at Queenstown since May, 1917, was considerably augmented.

A division of six battleships, the *New York* (flagship), *Texas*, *Arkansas*, *Nevada*, *Wyoming* and *Florida*, under command of Rear-Adm. Hugh Rodman, were sent abroad in December, 1917, and for a year constituted a division of the British Grand Fleet, doing their full share of the work. The American dreadnaughts were designated as the Sixth Battle Squadron, and were assigned a place of honor as one of the two "fast wings" that would take station at the head or rear of the entire battleship force in case of battle. On the return of the battleships to New York in December, Admiral Rodman, revealing for the first time the nature of their operations and their extent, said:

> When, on one occasion we came within a few miles of cutting off from its base and engaging the German fleet, the disposition was such that the American battleship division would have been in the van and have led into action, had not the enemy avoided action.
>
> It was our policy to go after him every time he showed his nose outside of his ports; no matter when or where, whether in single ships, by divisions or his whole fleet, out we went, day or night, rain or shine (and there was mighty little daylight and much less shine in the wintry months), blow high or blow low, and chased him back in his hole. Every inducement was offered him to come out. Inferior forces were sent down into the Heligoland Bight to induce him to attack; valuable convoys were dispatched, apparently without protection, and other devices to tempt him out, but he would not come.
>
> In our operations in the North Sea we were frequently attacked by submarines, and our battleships had numerous escapes, often only by prompt and skillful handling. On one occasion a submarine rammed the flagship *New York*, dented the bottom and demolished the starboard propeller. But there is every reason to believe that the blows from the propeller sank the submarine. En route to drydock, to make repairs and install a new propeller, three torpedoes in rapid succession were fired at her by hostile submarines, but again she avoided them by clever manœuvring and escaped.
>
> Once, when guarding or supporting a convoy of thirty or forty vessels on the coast of Norway in midwinter, a bunch of hostile "subs" fired six torpedoes at us. Again only our vigilance and instantaneous manœuvring saved us, but by a very close margin. There were still other attacks by submarines which necessitated quick action to avoid them.

The American battleships were present at the surrender of the German High Seas Fleet on Nov. 21, at Scapa Flow, Orkney Islands, which marked the end of Germany as a sea power. To give an idea of the immense size of the Grand Fleet, Admiral Rodman said that, entering or leaving port, the column of ships, excluding destroyers, was on an average about 65 miles long; on one occasion it was 76 miles.

Three other battleships, the *Utah*

(flagship), *Arizona* and *Oklahoma*, were sent over in the early summer, under command of Rear-Adm. T. S. Rodgers, and this division operated from the base at Berehaven, Ireland, protecting convoys and keeping guard against German raiders and other enemy craft. After taking part in the welcome of President Wilson on his arrival at Brest, all these battleships, led by the *Pennsylvania*, returned to home waters. They arrived at New York on Dec. 26, when the Secretary of the Navy held a review in which 10 battleships of the Atlantic Fleet and other craft also took part.

A flotilla of American submarines, sent over in January, was constantly employed, in coöperation with the British, against enemy submarines.

American destroyers from their bases on the British and French coasts patrolled vast areas, convoying troopships and merchantmen, hunting down submarines, and rescuing the victims of sunken craft. The total distance steamed by the units of one division in a six-month period was more than a million sea-miles. As examples of individual work, it is interesting to note that up to June 30, 1918, the *Sampson* had steamed 78,331 miles; the *Conyngham*, 77,431; the *Jenkins*, 70,667; the *Paulding*, 69,045; and others made equally good records. The number of submarines sunk by our destroyers and the many encounters have not been announced, but that they proved one of the decisive factors in defeating ruthless submarine warfare is undeniable, and both officers and vessels won numerous commendations and decorations from the British Admiralty as well as from our own Navy Department.

Only one American destroyer was sunk by a submarine, the *Jacob Jones*, torpedoed on Dec. 6, 1917. The *Chauncey*, a small destroyer of the older type, was sunk in collision with a British transport; and the *Shaw* was cut almost in half in a collision. The *Gassin* was struck by a torpedo in 1917, but reached port and was repaired. The *Manley* was seriously damaged in collision with a steamer, the collision exploding depth bombs on her stern, but was also repaired and put back into service.

Admiral Sims' reports show that during July and August, 1918, American destroyers based on British ports supplied 75 per cent. of the escorts for 318 ships, totaling 2,752,908 tons, including the escort of vessels carrying 137,283 United States troops. The destroyers on this duty were at sea an average of 67 per cent. of the time, and were under way for a total period of about 16,000 hours, steaming an aggregate of approximately 260,000 miles.

During the same two months 3,444,012 tons of shipping was escorted out of French ports. Of the tonnage escorted into French ports during this time only 16,988 tons, or 0.009 per cent., was lost through enemy action, and of the tonnage escorted out from French ports, only 27,858 tons, or 0.013 per cent., was lost through the same cause. During the same period 259,604 American troops were escorted to France by United States escort vessels without the loss of a single man through enemy action.

Vice-Adm. Henry B. Wilson was in command of the American forces on the French coast, with headquarters at Brest, the principal port for the debarkation of American troops. Whereas the previous year the submaines had been particularly destructive in that region, in 1918 sinkings were reduced to a minimum, in some months not a single Allied vessel being sunk by the enemy in that area. Two American troopships were struck by torpedoes off the French coast in the summer of 1918, one, the *Covington* (the ex-German ship *Cincinnati*), being so badly damaged that she sank while efforts were being made to tow her back to port; the other, the *Mount Vernon* (the ex-German ship *Kronprinzessen Cecilie*), being taken back to port under her own steam by a feat of seamanship that won warm official commendation.

The Mediterranean, which had been a favorite hunting-ground of the submarines, with a high percentage of Allied losses, was made, by the cooperation of the Italian, British, French and American navies, assisted by the Japanese, who sent a number of their destroyers, comparatively safe for commerce and transport. Rear-Adm. A. P. Niblack, with headquarters at Gibraltar, was in general charge of our activities in those waters.

The Azores, the Portuguese islands in mid-Atlantic which formed a convenient "half-way station" for ships on the way to France, became an important American naval base, a fleet of submarine chasers and some larger naval vessels operating from that point, where Rear-Adm. Herbert O. Dunn was stationed, in charge of American interests.

When the Italian Navy began its brilliant and successful operations against the Austrians, a flotilla of American submarine chasers was sent to the Adriatic, and these small vessels bore a part out of all proportion to their size or number in the Italian fleet. In the attack that resulted in the destruction of the Austrian naval base at Durazzo a flotilla of 12 submarine chasers, under command of Capt. Charles P. Nelson and Lieut.-Commander Paul H. Bastedo, sank one submarine which had torpedoed a British vessel and, it is believed, destroyed another Austrian submarine. During the bombardment under enemy fire they screened larger ships, and on the return voyage they screened the damaged British vessel and escorted an enemy hospital ship which was taken in for examination. Rear-Adm. W. H. G. Bullard, stationed at Malta, directed American activities in that region.

The Asiatic Station, whose forces coöperated with the Japanese and other Allies at Vladivostok, was in command of Adm. Austin M. Knight. The Pacific Fleet, which operated mainly on the east coast of South America and the Caribbean, patrolling that region for possible German raiders and cementing our cordial relations with South American neighbors by visits of amity and friendship to their ports, was under command of Adm. William B. Caperton.

There being no major naval battle during the year, the Atlantic Fleet, with the exception of the battleships sent to Europe, was held, for the most part, secure from torpedo attack in home waters. But every ship and crew was kept in a high state of efficiency, ready for instant action if the call should come. All these ships were utilized for intensive practical training in gunnery and engineering, and thousands of seamen gunners and engineers were turned out within a surprisingly brief period and sent for duty to the vessels operating on the Atlantic.

Transportation of Troops. — The transportation of more than 2,000,000 American troops 3,000 miles overseas with the loss of only a few hundred lives was one of the most remarkable achievements of the war. From the beginning this task was entrusted to the Navy, which took over Army transports and manned the vessels that were converted into troopships. From a few cruisers and hastily gathered troopships the Cruiser and Transport Force, under command of Vice-Adm. Albert Gleaves, grew to 24 cruisers and 42 transports, manned by 3,000 officers and 41,000 men. These were augmented by four French men-of-war and 13 foreign merchant ships, a total of 83 vessels. When the demand became insistent that American troops be hurried to France, Great Britain assigned a number of fast vessels to this service, and by the middle of the year 300,000 troops a month were being carried overseas. By July 1, 1918, 1,019,115 men had embarked, and on October 22 the number reached 2,008,931. A statement recently issued from Admiral Gleaves' office contained the following figures:

> Of the entire army of 2,079,880 men taken over, the statistics show 46¼ per cent. were carried in American ships, 48½ in British, and the rest in French and Italian vessels.
>
> Of the total strength of the naval escort guarding all these convoys, the United States furnished 82¾ per cent., Great Britain 14⅛, and France 3⅛.
>
> In actual numbers of men transported 912.082 were carried in American naval transports and 40,499 in other American ships; 1,006,987 were carried in British and 68.246 in British-leased Italian ships, and 52,066 by French and Italian ships.

Not a single American troopship was sunk or torpedoed on the way to France. Three were sunk on the return voyage, the *Antilles*, the *President Lincoln* and the *Covington;* two were struck by torpedoes, the *Finland* and the *Mount Vernon*, but both managed to reach port and were repaired. The interned German vessels which were taken over by this Government and repaired proved invaluable as troopships, the largest, the *Leviathan,* formerly the *Vaterland,* transporting nearly 100,000 troops to France. General March, Chief of Staff of the Army, in a recent statement in regard to the number of trips made and average number of troops carried by the principal American transports gave these figures: *Leviathan,* 10, 9,418; *Great Northern,* 10, 2,750; *Northern Pacific,* 10, 2,192; *Agamemnon,* 10, 3,521; *Finland,* 10, 2,166; *America,* 9, 4,088; *Mount Vernon,* 9, 3,737; *George Washington,* 9, 5,164; *President Grant,* 9, 8,894; *Susquehanna,* 9, 2,046; *Pocahontas,* 9, 2,260.

Naval Overseas Transportation Service.—Faced by the necessity of supplying the naval forces operating abroad and of aiding the Army in transporting and carrying supplies to the American troops in France, the Navy Department on Jan. 9, 1918, created the Naval Overseas Transportation Service. Beginning with only a few vessels, this service has grown in less than a year to a fleet of 321 cargo-carrying ships with a deadweight tonnage of 2,800,000 tons. Of this number 227 ships had been in operation prior to the war. From the Emergency Fleet Corporation the Navy took over for operation 94 new vessels, with a deadweight tonnage of 700,000. Of the 101 Dutch merchant vessels taken over by order of the President on March 21 (see II, *International Relations*), 26 became a part of the "N. O. T. S." fleet. Five thousand officers and 29,000 enlisted men were required to operate this fleet. Ten months after the inception of the N. O. T. S. an American naval vessel, manned by an American naval crew, left an American port on the average of every five hours carrying supplies to our troops in France.

Achievements in Ordnance.—Probably the most spectacular achievement of the Navy Bureau of Ordnance was the laying of the North Sea mine barrage, the largest ordnance project of the kind ever attempted. This was proposed by Rear-Adm. Ralph Earle, Chief of Ordnance, soon after this country entered the war, but it was not until the spring of 1918 that the plan was finally adopted and steps taken to put it into execution. A new type of mine, combining maximum destructiveness with safety in handling, was developed; 100,000 of these were manufactured, and a mine-loading plant capable of automatically loading more than 1,000 mines a day was established. An entire fleet of minelayers and vessels for transporting mines was created, manned, and put into operation. Two bases, under command of Rear-Adm. Joseph Strauss, were established at Inverness and Invergordon, on the coast of Scotland, from which the minelayers operated. Eighty five per cent. of this huge project, which stretched from the Orkneys 230 miles to Norway in the deep waters of the North Sea, was carried out by the U. S. Navy, no fewer than 82,000 mines made in this country being sent to Europe for the purpose. The American forces laid a total of 56,611 mines; the British laid 13,652. While the effectiveness of this barrage is almost impossible to determine with exactness, it is believed that no less than ten submarines were shattered or sunk, and the danger of running into this mine barrier greatly increased the difficulties of the submarines in making their way to the Atlantic.

When the imperative need of huge guns of long range for use on the western front was demonstrated, Navy ordnance experts pointed out that a number of 14-in. guns originally designed for battle cruisers could be made available for use ashore. Special railway mounts of a new type were designed in less than 30 days, and bids were submitted on Jan. 25, 1918. Work was begun in February, and on April 25 the first gun, mounted complete, left the shops for firing tests. Each battery comprised a complete train, with standard 83-ton locomotive, 56-ton tender, gun cars, armorplated ammunition cars, crane, construction, sand, timber, workshop, kitchen, fuel, and staff radio cars, berthing cars for officers and men, and battery headquarters. Five locomotives and 80 cars were built for the battery trains, and five of these batteries were sent to France. The guns are the largest ever placed on a mobile mount. They can be placed over the pit foundation ready for firing in an hour or less, and in the same space of time can be raised ready for removal. The first parts were shipped in June to St. Nazaire, France, and there assembled, and on September 25 the guns were put into action on the western front. Tests had shown a possible range of 55,000 yds., about 30 miles. The projectile thrown weighs 1,400 lb. These naval batteries, under command of Rear-Adm. C. P. Plunkett and manned by Navy gunners, threw their huge shells far in the rear of German lines, doing great destruction to railway bases and ammunition depots, tearing up lines of communication, and making retreat difficult. In the operations from Laon to Verdun they played an important part, and were in constant service until the suspension of hostilities.

The Navy manufactured 2,841 guns of medium calibres (that is, three- to five-inch calibre, inclusive) since the beginning of the war, of which 1,887 were actually placed in service; armed naval vessels and merchant ships, some of our Allies' vessels, as well as our own; furnished mobile land batteries for use ashore, these including seven-inch guns placed on caterpillar tractors and the big railway mounts; produced ample shells and ammunition for all vessels in operation under the Navy; and accumulated a large reserve supply.

The depth charge, which proved the most effective weapon against the submarine, was developed from a small, crude "can" carrying 50 lb. of explosive to a huge affair containing 600 lb. of TNT which can be operated with almost as much safety as any ordinary shell. At the beginning destroyers carried only four depth charges; before the end of the war they were carrying 50 as an average load. This, and the increased safety of handling, enabled them, instead of merely firing a single charge against a submarine, to drop a number of depth bombs covering the entire vicinity, and these depth-bomb barrages proved one of the most important factors in the destruction of submarines. A Y-gun was developed for firing depth charges, and depth bombs were devised for seaplanes to enable them to reach submerged submarines.

The Ordnance Bureau also succeeded in adapting the Davis non-recoil gun for use on airplanes. An airplane cannon had been regarded as impracticable because of the shock of the recoil, which would shatter the plane; but that difficulty was overcome by an open-breech gun which fires a charge between two projectiles of equal resistance to the force of the gases; thus compensating the shock and preventing any damage to the machine.

Successful tests have been made of the new 16-in. gun throwing a 2,100-lb. projectile, with which future American battleships and battle cruisers will be armed. A non-ricocheting shell has been developed which continues its trajectory under water. Another interesting recent invention is a star shell which illuminates enemy ships at sea without disclosing the position of the ship firing, thus obviating the principal objection to the use of searchlights. Naval experts believe that this will greatly increase the fighting effectiveness of our ships in night encounters.

Expenditures for naval ordnance increased to 30 times that of peace periods, growing from $30,000,000 a year to $600,000,000.

Shore Building.—Some idea of the amount of work done under the supervision of the Bureau of Yards and Docks, of which Rear-Adm. Charles W. Parks is chief, can be gained from the statement that the valuation of all the Navy's shore improvements at the beginning of 1917 was $221,000,000, whereas the improvements completed or contracted for since that time amount to $269,000,000. The 20 new camps and extensions built to house the increased personnel of the Navy and Marine Corps were nearly all completed or well under way by the end of 1917, but the year 1918 has seen a still further expansion. The capacity of Great Lakes Naval Station, near Chicago, has been doubled until that is now the largest naval training station in existence, accommodating 50,000 men. The Pelham Bay station, near New York, has been doubled in size, and large additions have been made to the camp at Hampton Roads Naval Base, Va., and other stations. Hundreds of warehouses for storage of supplies and munitions have been built, including some huge structures. One of the most notable single achievements of the Bureau of Yards and Docks during the year was the erection of the immense concrete and steel office buildings in Potomac Park, Washington, one housing the Navy Department, the other the Ordnance Division of the Army. These two structures contain more than 40 acres of floor space. The contract was let in February, the first concrete was poured on April 30, and by Aug. 17 the first occupants began moving in, the entire personnel being installed early in October.

With the expansion of the Navy and the building up of a large merchant marine ample drydocks have become a necessity. At the time the *Vaterland* was taken over, converted into a troopship, and rechristened the *Leviathan*, there was no place in this country where she could be docked. The Navy is just completing at the Norfolk Navy Yard a 1,000-ft. drydock that will accommodate any vessel afloat. Work has begun on another dock of the same size at the Philadelphia Navy Yard, and another is to be built at the Charleston (S. C.) Navy Yard. The Navy has also acquired the large drydock begun by the state of Massachusetts at Boston, and this is expected to be completed during 1919. The drydock at Pearl Harbor, Hawaii, which, owing to the nature of the site, presented problems that seemed almost insuperable, is nearing completion and will be ready for use in the spring of 1919.

Considerable extensions have been made to the principal navy yards, increasing their shipbuilding facilities, notably at New York, Philadelphia, Norfolk, Charleston, Mare Island, and Puget Sound. At Portsmouth, N. H., four submarine ways were installed. At New York a large, modern structural shop and a shipbuilding slip approximately 700 ft. long were started. At Philadelphia the programme included two building slips, structural shop, foundry, machine shop, fitting-out pier, minesweeper ways, power plant, boat shop, and auxiliary buildings. Similar improvements are being made at Norfolk. At Charleston three building slips for destroyers were completed.

Development of the Fleet Operating Base at Hampton Roads is proceeding, including the construction of a seawall and filling that will add 370 acres of ground to the station. A 1,400-ft. pier with a 1,000-ft. storage shed was practically completed. The base now includes training station, aviation base, and other features, and will embrace extensive warehouses for fleet supplies, recreation grounds, boat basin, and a submarine base, the intention being to make this a shore home for the men of the Fleet as well as an adequate operating base.

Growth of Naval Aviation. — On July 1, 1917, there were in the Naval Aviation Service only 45 aviators, these being officers of the Navy, Marine Corps, and Coast Guard who had had special training. There were about 200 student officers under training and approximately 1,250 enlisted men, assigned to the three air stations then in commission, Pensacola, Bay Shore, Long Island, and Squantum, Mass.; the latter was abandoned in the fall of that year. Just one year later, July 1, 1918, Naval Aviation included 823 aviators, 2,052 student officers, and 400 ground officers. Added to these were 7,300 trained mechanics and 5,400 in training, the total enlisted and commissioned personnel being about 30,000. Naval air stations have been established at strategic points all along the coast, with a station in the Panama Canal Zone, and a large portion of the coast has been constantly patrolled by naval aircraft. During the year the Navy also took over operation of numerous coastal patrol stations in England, Ireland, and France, and not only carried out active anti-submarine patrols but also was extensively engaged in aiding the Fleet with the convoy work. In a typical month along the United States coast a total of 25,642 flights were made, covering about 2,155,860 miles by seaplanes, and lighter-than-air craft during same period made 613 flights, covering about 56,420 miles.

On the coast of France the United States naval air forces operated eight seaplane, three dirigible- and three kite-balloon stations, and formed a part of the Northern Bombing Group which continually bombed the German submarine bases at Ostend and Zeebrugge and other points along the Belgian coast. Operating with British units, our aviators took part in various expeditions over the German coast, including several encounters with enemy seaplanes over Heligoland Bight. In Ireland seaplane stations were maintained at Whiddy Island, Queenstown, Wexford, and Lough Foyle and a kite-balloon station at Berehaven. There was marked improvement in aircraft, American constructors devising flying boats superior to any previously in existence. From the comparatively small seaplane in use when the war began, types have been improved and size increased up to the huge NC-I with its three Liberty motors, which on a recent flight carried no fewer than 50 passengers. The Naval Aircraft Factory at the Navy Yard, Philadelphia, which was put in operation a year ago, has been more than doubled in size, and now has more than 4,000 employees engaged in building and assembling the latest types of flying boats.

Training Officers and Men.—"The dauntless determination which the United States has displayed in creating a huge trained body of seamen out of landsmen is one of the most striking accomplishments of war," said Sir Eric Geddes, First Lord of the British Admiralty, on his visit to this country last October. "Had it not been effectively done, one would have thought it impossible, and words fail me to express our admiration of this feat undertaken and accomplished by your Navy Department." Making seamen of raw volunteers and training competent officers was a much more difficult task than enlisting recruits. Not only was intensive training put into effect at every naval station, but special schools were created in all branches, a number being operated at colleges and technological institutes. Schools for ensigns were established at various stations, the students being drawn by competitive examination from the most promising officer material in the enlisted personnel. More than 11,000 warrant officers and enlisted men have been promoted to commissioned rank, and have proved capable and efficient. The demand for gunners and engineers was particularly urgent and every ship was utilized for practical training in gunnery and engineering. Thousands were trained on the battleships of the Atlantic Fleet in home waters, and this work of the "silent fleet" was a notably valuable service. As rapidly as ships were acquired or completed, crews were ready to man them. The shore training facilities of the Navy increased during the war period from provision for 6,000 men to provision for nearly 150,000.

The increase of the enlisted and enrolled strength of the Navy from 65,000 to 500,000; the furnishing of crews for 1,800 vessels, and the enrolling and training of more than 25,000 officers was the work accomplished by the Bureau of Navigation. The Naval Reserve Force has grown during the year from 85,000 to over 300,000—290,000 enlisted men and 21,985 officers. By provision of law the National Naval Volunteers, comprising about 15,000 naval militia in Federal service, were combined with the Naval Reserve. Although some slight changes in its organization may be necessary, this Reserve Force has so thoroughly proved its value and its superiority to the old system of naval militia that its continuance is assured. The Naval Appropriation Act of July 1, 1918, increased the authorized permanent strength of the Navy to 131,485 enlisted men and 6,000 apprentice seamen. Officials of the Bureau of Navigation estimate that there must be an increase of nearly double this number to meet the needs of the service in 1919.

The Radio System. — The Naval Communication Service, which at the beginning of the war took over all radio stations in the United States and its possessions, now operates the largest radio system in existence. The number of shore stations has been increased from 58 to 111. All American radio stations are owned by the Navy except 16 privately owned commercial stations, five of these being low-powered units in

Hawaii, and four high-powered stations owned by the Marconi Company. New high-powered stations have been erected at Annapolis, Md.; Pearl Harbor, Hawaii; Cavite, P. I.; and in Guam. Communication with the Philippines requires only one relay, at Pearl Harbor. Direct communication from Sayville to Rome was established on Jan. 1, 1918. The stations at Tuckerton, Sayville, New Brunswick, N. J., and Annapolis work direct with Carnarvon, Wales; Lyons, France, and Rome, and the messages sent out from the Nauen Towers, in Germany, are easily received. A new station, the "Lafayette," is being erected at Bordeaux, France, which will be the most powerful in the world, insuring reliable trans-Atlantic communication at all seasons. "Receiving centres" have been established at Otter Bay, Me., and other points on the Atlantic coast, connected by wire with the main control station at Washington, more than doubling the capacity of the wireless system.

Naval Losses.—A total of 44 naval vessels or vessels manned by the Navy were lost during the war. Four others were torpedoed or mined but either got to port under their own steam or were salvaged. These included three troopships sunk by submarine, the *Antilles*, Oct, 17, 1917; the *President Lincoln*, May 31, 1918; the *Covington*, July 1, 1918; three destroyers, the *Jacob Jones*, torpedoed Dec. 6, 1917; the *Chauncey*, sunk in collision Nov. 19, 1917; and the *Shaw*, cut in twain in collision Oct. 9, 1918; the armed yacht *Alcedo*, torpedoed Nov. 5, 1917; the Coast Guard cutter *Tampa*, sunk with all on board Sept. 26, 1918; the armored cruiser *San Diego*, sunk by enemy mine in home waters July 19, 1918; eight cargo ships torpedoed, three sunk by mines; the revenue cutter *Mohawk*, the submarine *F-1*, the yacht *Wakiva II*, the gunboat *Schurz* (ex-German *Geier*), four cargo ships and four submarine chasers sunk in collisions; and 11 cargo vessels and submarine chasers grounded, burned, or sunk by internal explosion. The disappearance of the collier *Cyclops*, with 293 crew and passengers, is one of the mysteries of the seas. Since the *Cyclops* left Barbados, where she put in March 4, 1918, to take on bunker coal, there has been no trace of the ship. Next to the *Cyclops* the greatest loss of life was on the *Ticonderoga*, an animal cargo transport, which carried down 216 men and officers, including Army personnel, and on the *Tampa*, all of whose crew of 112 were lost.

The total number of American merchant vessels sunk by German submarines or raiders during the war was 151, of 315,588 tons, with a loss of 409 lives. Of these there were sunk before the United States entered the war on April 6, 1917, 21 vessels, of 67,815 tons, with a loss of 67 lives.

During the war 36 naval officers were killed in actual combat with the enemy and 234 died from natural causes. The casualty and accident list of the enlisted personnel was: dead, 893; injured, 130; interned, 55; missing, 22; prisoners, eight; unaccounted for, three.

Naval Administration.—Few changes have been made in the administrative officers of the Navy Department. Rear-Adm. Charles W. Parks was appointed Chief of the Bureau of Yards and Docks to succeed Rear-Adm. F. R. Harris, who resigned to become head of the Emergency Fleet Corporation. Rear-Adm. George R. Clark was appointed Judge-Advocate-General, succeeding Capt. W. C. Watts, who took a sea command. Capt. Victor Blue on Jan. 1, 1919, became Chief of the Bureau of Navigation, succeeding Rear-Adm. Leigh C. Palmer, who had served as Chief of the Bureau during the period of the war and resigned to see active service as chief of staff to Rear-Adm. Hugh Rodman, commander of the battleship force on duty with the British Grand Fleet. The other bureau chiefs remain as before (see IV, *National Administration*). Rear-Adm. Ralph Earle continues as Chief of the Bureau of Ordnance. Secretary Daniels in his report credited the Navy's readiness and success in large part to the excellent system that had been built up in peace times. He pointed out that the war had necessitated no change in the organization of the Navy Department, which had easily expanded to meet the emergency.

XII. ECONOMIC CONDITIONS AND THE CONDUCT OF BUSINESS

S. S. Huebner

BUSINESS CONDITIONS IN 1918

Another Year of Extremes.—Last year's account described 1917 as a year of extremes, some business lines enjoying an extraordinary boom while others experienced the utmost depression (*A. Y. B.*, 1917, p. 299). During 1918 the leading barometers of industry, finance and commerce indicate even greater extremes. In fact, so abnormal has been the general business situation, owing to tremendous business readjustments and the high pressure of production occasioned by the war, that there is reason to believe that the year 1918, now that hostilities have been terminated, will mark the high and low records in most lines of business for a long time to come.

A brief *résumé* of the leading indices of trade will serve to show these extremes. Bank clearings exceeded those of 1917 by 17.5 per cent., despite the fact that that year's record exceeded the clearings of 1916 by 30 per cent. and was nearly double the total for 1914. Railroad gross earnings again broke all records, being 9.63 per cent. larger than in 1917; this gain coming on top of an increase of 11.78 per cent. for 1917, and another increase of 23.37 per cent. during 1916. Up to the end of November, business failures were lower by 25 per cent. in number and 14 per cent. in amount of liabilities involved, as compared with decreases of 11 per cent. and six per cent., respectively, for 1917, and these declines, in turn, represent a comparison with a very favorable record for 1916. Exports of merchandise for the year show a volume second only to the record-breaking total of the preceding year, but even here the decline is only inappreciable, being less than one per cent. Imports, on the other hand, established a new high record. Were exports sent directly to the American Army abroad included in the total (they are excluded by the Government), the year's foreign trade would greatly exceed the record-breaking total of 1917, and this despite the numerous Government embargoes and restrictions upon various classes of articles entering into our foreign commerce. The unprecedented iron, steel and copper production of 1916 and 1917, representing the greatest boom these industries have ever enjoyed, has also continued with comparatively little variation. Prices for the various metals, it is true, are considerably lower than in 1917, but this is due to the Government's policy of price fixing. In conjunction with all this prosperity, money rates, although showing a tendency to increase, have remained reasonably low for essential business purposes. Here again the Government has exerted a salutary influence by supervising credits and new capital issues. Moreover, the Nation was again blessed with a crop practically equal to the very satisfactory yield of 1917.

But the Nation's entrance into the war had as crushing a result in certain directions as it had a stimulating effect in others. The reasons for this were discussed last year (*A. Y. B.*, 1917, p. 299), and it will suffice merely to indicate the extremes that have resulted. Last year's account showed that the security market of 1917 experienced one of the greatest declines in its history, three well chosen lists of stocks, representing railroads, industrials, and coppers, suffering a shrinkage of 22 per cent., 27 per cent., and 29 per cent., respectively, in 11 months. The market of 1918, on the contrary, was as dull and firm as the market of 1917 was violent and weak; but the price level maintained throughout the year, it should be noted, remained practically at the low figures reached in the drastic liquidation of 1917. The decline of 31 per cent. in the volume of transactions and the continued low level of prices, many of them at panic figures, are indicative of the discounting function of the market with reference to *post-bellum* conditions. Building operations fell off by approximately 40 per cent., and 1917 likewise showed a decline of nearly one-third as compared with the preceding year. Railway net earnings, owing to the enormous rise in wages and materials, experienced the unparalleled decline of 50 per cent. New incorporations were less than one-half those of 1917, and the issue of new securities also showed a substantial decline of 22 per cent. Listings on the New York Stock Exchange almost reached the vanishing point, the total (exclusive of Liberty Bond listings) being only 13 per cent. of the 1917 figure. But this abnormal showing of the financial barometers is primarily due to the artificial restraints imposed by the Government. In every way possible the Government sought to force the flow of surplus funds into Government bonds and to limit other corporate financing to enterprises approved as belonging to the war-aiding class. To this end, as will be explained later, new capital issues, as well as building permits, had to receive Government sanction. Moreover, with the aid of the New York Stock Exchange, restrictions of a drastic character were imposed from time to time upon speculative transactions in the security market.

Lastly, it should be noted that 1918 witnessed a continuation of the tendency towards a higher level of commodity prices. Although the price levels of 1915 and 1916 seem very high, the November level of 1917, as judged by Bradstreet's index number, was 41 per cent. higher than that of a year previous. In 1918, again, the first nine months show a further increase of 22 per cent. as compared with the corresponding period of 1917. Had it not been for artificial restrictions in the form of Government "fixed" or "maximum" prices, there is reason to believe that the rise in commodity prices would have been even greater. Needless to say, so enormous an increase in prices has affected disastrously the net earnings of industries, such as railroads, express companies, telegraph and telephone companies, and other public-service corporations, that find it difficult, if not impossible, to raise the price of their services to correspond with the increased cost of operation. But in the case of the first three types of services mentioned, the Government again came to the rescue and saved a critical situation by guaranteeing their income on a liberal basis.

Statistics. — Following the plan adopted in previous issues of the YEAR BOOK, we present a series of tables which summarize the business conditions of 1918 in comparison with those of 1917 and earlier years, as shown by those leading indices[1] which are generally accepted as the truest barometers of industry, trade and finance. The tables relating to stock-market activity, including summaries of "Shares of Stocks and Bonds Sold," "Average Security Prices," and "New Securities Listed," indicate the activity or lack of activity during the year in the security market and the condition of the investment demand. The tables relating to "Loans and Deposits of the New York Clearing House Banks" and "Domestic and Foreign Money Rates" furnish an idea of the conditions surrounding the money market during 1918; and the tables on "Bank Clearings," "Foreign Trade," "Cereal Production," "Railroad Earnings," "Idle Cars," "Production of Iron and Copper,"

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[1] The author is indebted for the statistical data presented in most of the following tables to the monthly compilations prepared from authentic sources by Roger W. Babson, and issued periodically in "Babson's Desk Sheet of Tables on Barometric Figures and Business Conditions." In the collection of data much assistance has been obtained also from the excellent compilations and reviews published periodically by the *Commercial and Financial Chronicle*.

"Building Construction," and "Business Failures" serve to furnish a view of the year's activity in mercantile and manufacturing lines. For purposes of comparison, the figures are given by months for the years 1918 and 1917, and to make possible a further comparison, the totals for the several items, wherever possible, are given also for 1916 and 1915.

AGRICULTURE

Crop Production. — The grain-crop statistics of the United States for 1918, as indicated by the October estimate of the Department of Agriculture, present a favorable showing as regards the grand total, although in the case of the nation's leading crop, corn, the yield fell short of the record crop of 1917 by nearly 500 million bushels. Considering the five leading cereals, wheat, corn, oats, barley, and rye, the estimated yield for 1918, as indicated by the accompanying table, shows a total of 5,482,000,000 bus., a decrease of 224 million bushels, or less than four per cent. as compared with 1917. But this slight decrease must be viewed in the light of the fact that the 1917 yield was 924 million bushels over that of 1916. Even comparing the yield of 1918 with the sum total of the previous records of each of the five aforementioned cereals, the decrease is only 511 million bushels. Fortunately for the food situation, especially in view of the comparatively small supplies carried over from the preceding year and the necessity of maintaining heavy exports for the support of our own army and our Allies, nearly all other leading agricultural staples also show a reasonably large increase. (See also XVI, *Agriculture.*)

In view of the two dismal wheat crops of 1917 and 1916, the 1918 yield is the most satisfactory feature of the crop situation. The October estimate places the yield at 918 million bushels, as compared with 699 million bushels in 1917 (an increase of 37.2 per cent.), 608 million bushels in 1916, and a five-year average (1912-16) of 809 million bushels. The spring-wheat yield was excellent, being estimated at 363 million bushels, as compared with only 242 million bushels in 1917 (an increase of 50 per cent.) and a five-year average (1911-15) of 256,751,000 bushels. The winter-wheat crop also indicates an increase of 33 per cent., the estimated yield amounting to 555,725,000 bus., as compared with 418,070,000 bus. in 1917, 455 million bus. in 1916, and a five-year average of 552,595,000 bus. Moreover, when allowance is made for the anticipated saving of 30 million bushels through closer extraction from the grain in flour making and the conservation of considerably more through the use of substitutes, the 1918 crop may be regarded, as far as practical results go, as the equivalent of the record yield of a billion bushels in 1915. Fortunately, also, the average in quality of the 1918 crop is reported to be fully up to standard.

The improved wheat crop, however, is offset by the disappointing yield of corn. Owing to the severe drought during the latter part of the crop growing season, the October estimate promises a yield of only 2,717,775,000 bus., a decrease of 442 million bushels, or 14 per cent., as compared with the actual yield of 1917. But even here we must bear in mind that the 1918 yield is only 44 million bushels under the five-year average for 1912-16.

Most of the remaining important agricultural crops also present a favorable showing as compared with 1917 and 1916. The yield of oats is placed at 1,535,297,000 bus., or only 3.3 per cent. under the actual yield of 1917 and 239,000,000 bus. in excess of the five-year average. The barley crop is estimated at 236,505,000 bus., or 13 per cent. more than the yield of 1917 and 34 million bushels in excess of the five-year average. As regards the yield of the remaining eight most important crops, the showing, as compared with 1917, is as follows: rye, 76,687,000 bus., an increase of 26.6 per cent.; buckwheat, 19,473,000 bus., an increase of 11.5 per cent.; white potatoes, 391,279,000 bus., a decrease of 11.3 per cent. from the extraordinarily large crop of 1917 but an increase of nearly eight per cent. over the five-year average; sweet potatoes, 85,473,000 bus., a de-

CEREAL PRODUCTION

(000,000 omitted)

Production (bushels)	1918[1]	1917	1916	1915	1914	Previous Records	
Winter wheat	555	417	455	655	685	685	(1914)
Spring wheat	363	242	153	357	206	357	(1915)
Corn	2,717	3,210	2,718	3,055	2,673	3,210	(1917)
Oats	1,535	1,580	1,230	1,540	1,141	1,580	(1917)
Barley	236	201	184	237	195	237	(1915)
Rye	76	56	42	49	43	56	(1917)
Total	5,482	5,706	4,782	5,893	4,943	5,993	

[1] October estimate; the final December estimate is given under XVI, *Statistics of Agriculture.*

crease of slightly less than two per cent., but an increase of nearly 32 per cent. over the five-year average; tobacco, 1,265,362,000 lb., an increase of 5.8 per cent.; flaxseed, 15,606,000 bus., an increase of 85.7 per cent.; rice, 41,918,000 bus., an increase of 15.7 per cent.; and apples, 198,389,000 bus., an increase of 13.5 per cent. Only in the case of hay, excluding from consideration certain minor products, does the 1918 yield show a considerable decline as compared with 1917, the decrease being 9.2 per cent. But here again it should be noted that the 1918 yield of 86,254,000 tons is only slightly smaller than that indicated for the five-year average. (See also XVI, *Agriculture.*)

Cotton Production.—In cotton the yield will prove very disappointing, especially in view of the bad showing for the preceding two years. In fact, owing to the effects of severe drought and insect pests, the estimated yield is placed even lower than the mark for 1916, the lowest on record. The Government's October estimate places the condition of the cotton crop on September 25 at 54.4 per cent. of normal, as compared with 60.4 per cent. on the corresponding date of 1917, 56.3 per cent. in 1916, and 65 per cent. for the past ten-year average. The condition of 54.4 per cent. forecasts a yield per acre in 1918 of only 154.1 lb. and a total production of about 11,818,000 bales, not including linters, as compared with 12,047,000 bales in 1917, 11,499,000 bales in 1916, and 14,176,000 bales for the five-year (1911-15) average. It is largely because of this small yield, together with the heavy requirement for cotton, that the price has greatly exceeded the high price of 1917 and has remained extraordinarily high during the entire year. On Oct. 1 the country price of spot cotton stood at 31.8 cents, as compared with 23.3 cents for the corresponding date in 1917, and 11.8 cents for the five-year (1912-16) average. (See also XVI, *Agriculture.*)

Prices of Staple Agricultural Products.—Owing to the general tendency toward price inflation and the huge export demand, current prices of agricultural products have held during the whole of 1918 to a level even in excess of the very high prices prevailing in 1917. The following table of farm prices prevailing on Oct. 1, as published by the Department of Agriculture, shows that the substantial increase, or the maintenance of a high level, in prices has been general; the prices are per bushel except when otherwise indicated:

	1918	1917	1916	Five-Year Average 1912-16
Wheat	$2.058	$2.006	$1.584	....
Corn	1.595	1.751	0.850	$0.753
Oats	0.710	0.623	0.490	0.391
Barley	0.955	1.139	0.832	0.573
Rye	1.540	1.698	1.153	0.799
Buckwheat	1.800	1.544	1.029	0.773
Potatoes:				
White	1.436	1.221	1.357	0.701
Sweet	1.606	1.161	0.806	0.824
Flaxseed	3.809	3.085	2.347	1.490
Cotton (lb.)	0.318	0.233	......	0.118
Apples	1.335	1.068	0.876	0.693
Hay (ton)	18.450	13.830	9.990	10.580

Thus it appears that the average price for nine leading farm products—wheat, corn, oats, barley, rye, buckwheat, white potatoes, sweet potatoes and flaxseed—increased 8.9 per cent. as compared with 1917; nearly 48.5 per cent. as compared with 1916;

and nearly 126 per cent. as compared with the five-year average, 1911-15. For three other leading crops—cotton, apples and hay—the gains in price as compared with 1917 were, respectively, 36.5 per cent., 25 per cents., and 33.4 per cent. (See also XVI, *Agriculture*, and *Statistics of Agriculture.*)

IRON AND STEEL TRADE

Iron Production.—The unprecedented pig-iron production, discussed in the issues of the YEAR BOOK for 1916 (p. 324) and 1917 (p. 302) has been continued during 1918 with comparatively little variation. During the first nine months of the year (the latest for which final figures are available), every month except January and February shows a production exceeding the 3,200,000-ton mark, while monthly production at the end of the period was at the rate of 3,418,000 tons (September), or more than the production recorded for any month during 1917. For the first nine months of 1918 total production amounted to 28,231,000 tons. This represents a decline of only slightly over two per cent. as compared with the exceedingly heavy production during the corresponding period of 1917, but an increase of 38 per cent. over the corresponding production of 1915. Total production for the year 1917 reached the stupendous amount of 38,185,000 tons, and the output of 1918 bids fair to equal this record. The effect of the war demand upon the iron industry is indicated by the fact that production during the years 1916-18 (to September of 1918) aggregated 95,450,000 tons, as compared with 74,000,000 tons for the corresponding period in 1913-15, an increase of over 30 per cent. (See also XVII, *Iron and Steel;* and XVIII, *Manufactures.*)

Not only has the production been enormous, but the price for iron has been maintained at a high level. In the last issue of the YEAR BOOK (p. 302) it was explained that during 1916 the price per ton increased from an average of $17.90 for January to $25.90 for December; that subsequently the unprecedented war demand caused prices to rise beyond all reasonable limits, the high price of $49.90 prevailing during the months of July, August and September of 1917; that in the fall of 1917, owing to the Government's policy of controlling prices, the level was reduced to $35.90; and that this price, although representing a radical drop, nevertheless exceeded the price prevailing at the beginning of 1915 by nearly 200 per cent. The Government's price of $35.90 established in October, 1917, it may be added, continued to be the price until the close of June of 1918. For the following three months, however, the price was raised to $36.60, and for October it is reported that the price averaged $37.60. For the first ten months of 1918 the price has averaged $36.17, or only $2.76 below the average price for all of 1917.

The Steel Trade.—Owing to the immense Government requirements in connection with war orders, the steel trade has continued to enjoy the greatest boom in its history (see also XVIII, *Manufactures*). There are indications, however, judging from newspaper accounts of the cancellation of large Government contracts and the current publication of unfilled order figures, that the unprecedented prosperity of this business has about seen its maximum and that before long a decided contraction in the volume of business will be experienced. The volume of this business is best indicated by the record of unfilled orders of the U. S. Steel Corporation. Such orders, usually considered an excellent index of trade, show an average of 8,862,426 tons for the first nine months of 1918, as compared with 11,255,561 tons for the corresponding period in 1917, 9.334,119 tons in 1916, and 4,567,705 tons in 1915. In other words, the unfilled orders of the U. S. Steel Corporation for the first nine months of 1918 show a decline of 22.1 per cent. as compared with the corresponding period of 1917, thus furnishing evidence of the aforementioned prospective contraction in the output of the steel industry. Yet sight should not be lost of the fact that the 1918 figures, despite the indicated decline, are nearly twice the total for the corresponding periods in 1915 and 1914.

The highest record of unfilled orders in the war boom was attained in April, 1917, when the average for the month stood at 12,183,083 tons. Since that time there has been a marked tendency toward a gradual decline. For January of 1918 the average stood at 9,477,853 tons. Since that time every month with the exception of June has shown a decline as compared with its predecessor. The September average of 8,297,905 tons indicates a decline of 12.4 per cent. as compared with the showing for January, and of 6.4 per cent. as compared with the average for the first nine months of the year. The totals of unfilled orders by months for the last three years are as follows:

	1916	1917	1918
January......	7,922,767	11,474,054	9,477,853
February.....	8,568,966	11,576,697	9,288,453
March........	9,331,001	11,711,644	9,056,404
April.........	9,829,551	12,183,083	8,741,882
May..........	9,937,798	11,886,591	8,337,623
June.........	9,640,458	11,383,287	8,918,866
July..........	9,593,592	10,844,164	8,833,801
August.......	9,660,357	10,407,049	8,759,042
September....	9,522,584	9,833,477	8,297,905
October......	10,015,260	9,009,673	8,353,293
November....	11,058,542	8,897,106	8,124,663
December....	11,547,286	9,381,718	7,379,152

THE COPPER TRADE

Production and Price.—As was the case in 1916 and 1917, the prosperity existing in the iron and steel business has been fully duplicated in the copper industry, and the excellent showing is again traceable to the heavy use of the metal in connection with the war (see also XVIII, *Manufactures*). Unfortunately, as was also the case during the three years preceding, only estimates of the production are available. These place the total production for the first nine months of 1918 at 1,642,000,000 lb. as compared with 1,442,000,000 lb. for the corresponding period of 1917, 1,691,000,000 lb. for 1916, and 1,084,000,000 lb. for 1915. Production for 1918 has thus taken place at a rate 13.8 per cent. in excess of the corresponding period for 1917. At the same time it is noteworthy that the price of the metal has continued at a high level. As was pointed out last year (*A. Y. B.*, 1917, p. 303) the average price for electrolytic copper at New York was 13.64 cents during January, 1915. Following that period the price of the metal showed a gradual rise until it reached an average of 27.20 cents for the year 1916, and 27.18 cents for 1917, the high-water mark of 31.75 cents being reached in February, 1917. Since then there occurred a rapid but gradual decline until 23.50 cents was reached in October, 1917, this being the price fixed for the metal by the Government. This figure continued until July of 1918, when the price was increased to the present figure of 26.00 cents. Despite the Government's policy of price fixing, however, it should be noted that the average price of 24.34 cents for the first ten months of 1918 was only 2.84 cents below the average price for 1917.

PRODUCTION OF IRON AND COPPER

	Pig Iron, tons (000 omitted)		Copper[1], pounds (000 omitted)	
	1917	1918	1917	1918
January....	3,151	2,412	175,000	157,000
February...	2,645	2,319	180,000	152,000
March.....	3,251	3,213	190,000	185,000
April......	3,335	3,288	188,000	175,000
May.......	3,417	3,446	185,000	180,000
June.......	3,270	3,324	170,000	185,000
July.......	3,342	3,421	118,000	189,000
August....	3,248	3,390	118,000	204,000
September..	3,134	3,418	118,000	215,000
October....	3,303	3,487	146,000	220,000
November..	3,206	3.354	142,000	213,000
December..	2,883	3,434	158,000	211,000

[1] Estimated.

Copper Stocks. — The continued heavy demand for the metal at a very high price level, however, has not had a corresponding favorable effect upon the quotations of leading copper shares. Partly because of the system of excess-profits taxation and partly because of the tendency of the security market to discount future business conditions, copper shares have continued during the year to sell at a comparatively low level. At the beginning of November the price of Babson's list of 20 active and representative copper stocks stood at 42.4, as compared with an average of 39.3 at the close of November of 1917, 66.5 in November, 1916, and a low of 35.4 in December, 1917.

FOREIGN TRADE

Volume of Foreign Trade.—Exports for the fiscal year ending June 30, 1918, show a volume second only to the record-breaking amount of the preceding year; even so the decline, expressed in terms of value, is only inappreciable. Imports, on the other hand, established a new high record by 287 millions. And this remarkable showing was attained despite prohibitions placed upon the shipment of various important classes of articles and serious restrictions placed upon the movement of others regarded as non-essential to the conduct of the war in a far-reaching endeavor to save cargo space for essential traffic. Viewed from every possible angle, our foreign-trade figures again reveal a continuation of the nation's remarkable prosperity—in fact, are indicative of an abnormal situation. Wholly as a result of the huge demands upon us for supplies and materials necessary for the prosecution of the war and the enormously increased price level at which all commodities must be valued, the exports of the United States have reached a monetary value far beyond any expectations that might have been entertained prior to the beginning of hostilities.

Exports of merchandise during the fiscal year of 1918 amounted to $5,928,337,953, against $6,290,048,000 in 1916-17, $4,333,482,885 in 1915-16, and only $2,364,579,148 in 1913-14. Although the 1918 return, expressed in terms of value, is 5.7 per cent. under that of the preceding year, it is still over two and one-half times the total exports of the year prior to the breaking out of the war. Imports, on the other hand, show a considerable increase over the large increase of the preceding year. The total for 1918 amounted to $2,946,022,363, against $2,659,355,185 in 1916-17 (an increase of 10.8 per cent.), $2,197,883,510 in 1915-16, and $1,894,000,000 in the year prior to the commencement of hostilities. The net balance of trade in our favor amounted to $2,982,315,590, against $3,635,000,000 in the preceding year and a record balance of trade in pre-war days of $666,431,000 in the fiscal year 1908. It is also worthy of note that since the war started our balance of exports amounts to the stupendous total of $10,650,000,000, a situation made possible only through the billions loaned by this country to the Allies. (See also XIX, *External Commerce.*)

Effects of War Conditions.—Foreign-trade returns for the fiscal year 1918 thus show, as do few other business barometers, the large part played by war orders in our present prosperity. But, as was pointed out in the last issue (p. 304), the marvelous increase in exports is also conclusive proof that the present pace cannot be continued long following the return of peace and the consequent discontinuance of existing extraordinary war demands. Prior to the war, 278 millions represented the greatest value of merchandise exports for any month (November, 1912). Then, as pointed out in the last issue, there followed in rapid succession a long series of monthly records, until January, 1917, when monthly exports totaled 613 millions. Following that date, owing largely to embargoes or lesser restrictions on exports of specified articles or with reference to certain European neutrals, a considerable decline occurred. Yet, despite this decline, the aggregate exports for the first nine months of 1918 total $4,560,800,247, as compared with $4,603,948,751 for the corresponding period of 1917 (a decline of less than one per cent.), and with $3,950,426,079 for 1916, or an increase of 15.7 per cent. And it should be noted that our export figures do not include supplies sent to the United States army abroad. Accordingly, in view of the heavy movement of troops abroad during the year and the fact that the reported total for the current year to date is substantially the same as for the similar record of the preceding year, it follows that the 1918 movement of goods abroad has in reality considerably exceeded all previous records. In the case of imports also the total for the first nine months of the year is approximately the same as for the corresponding period of 1917, owing principally to shipping restrictions upon numerous classes of imports, although considerably greater than in 1916. The total for the nine months of 1918 is $2,321,981,345, as compared with $2,282,794,503 for the same period in 1917 and $1,831,174,668 in 1916.

A detailed analysis of our foreign-trade returns for the fiscal year reveals four main factors, all emphasizing the importance of war conditions. The first relates to the continued heavy movement of traffic to Great Britain, France, Italy and Canada, the absence of traffic to the Central Powers, and the decline of exports to European Russia from 429 millions to 117 millions. To the first four countries mentioned, exports during 1917-18 totaled $4,142,000,000, or nearly 70 per cent. of the nation's grand total, and only 64 millions under the total to the same countries for the preceding year. With respect to Great Britain, France, and Canada there was a slight decrease in exports in each instance, but in the case of Italy a remarkable increase of 117 millions, or nearly one-third, was recorded.

But while the traffic to leading European countries has remained substantially the same, it is important to note that a very appreciable increase occurred in our exports to certain markets which in pre-war days played a relatively unimportant part in our commerce. Here again war demands unquestionably constituted the chief cause; yet, the steady increase in this particular traffic may well arouse the hope that, by following a proper course, a large share may be retained and extended in *post-bellum* days. To quote the *Commercial and Financial Chronicle's* review:

> For the eleven months for which details are available we note that the outflow of commodities to Cuba have risen in value from 68½ million dollars in 1914-15 to 162 millions in 1916-17 and no less than 218 millions in 1917-18. A similar comparison for South America is between 85½ millions and 232 millions and 282½ millions; East Indies, 17 millions and 52 millions and 65 millions; Japan, 37 millions, 117 millions and 252 millions; and Oceania, 68 millions, 97 millions and 124 millions. These gains, of course, can be ascribed in considerable measure to higher prices, but they nevertheless accrue to the benefit of the United States and partially offset the losses shown in the exports to Great Britain, France and Russia.

Third, the increase in exports and imports was shared quite generally by the same leading groups of commodities that appeared most prominently in last year's report (p. 304). Exports of breadstuffs increased during the last fiscal year by 44½ millions over the preceding year; meat and dairy products by 277 millions; cotton, despite a decrease in volume, by 122 millions; cotton cloth, 30 millions; mineral oils, 67 millions; coal, 30 millions; and iron and steel manufactures, 40 millions. In the list of substantial decreases may be mentioned explosives, with a decline of 400 millions; brass, 300 millions; leather, 50 millions; horses and mules, 61 millions, and copper and sugar with 30 millions each. But in some of these instances the articles were, in reality, shipped in much larger quantities than indicated, the present policy being to omit the publication of exports destined directly for the maintenance of the American army abroad. With reference to imports, the largest increases were reported in the case of crude articles for use in manufacturing in this country. Decreases occurred chiefly in unnecessaries, or in commodities the output of which was severely curtailed by conditions in foreign countries or the shipment of which was impeded by restricted shipping facilities, such as art works, 12 millions; coffee, 26 millions; hides and skins, 60 millions; and diamonds and precious stones, 12 millions.

Lastly, attention should again be called to the extent to which the huge total of exports and imports is explainable by the increase in prices, as contrasted with the actual volume of commodities moved. A detailed analysis in this respect would indicate that while the Government's figures for the last fiscal year show an increase of about 140 per cent. over the heaviest pre-war year, 1912, the volume shipped was but slightly greater. To quote the excellent summary in the *Commercial and Financial Chronicle* on this point:

> In most cases the prices of commodities entering into our export trade are fully double what they were before the war broke out, and in many the inflation has been even greater. We offer as confirmation of the foregoing

FOREIGN TRADE

	Imports		Exports		Balance of Trade	
	1917	1918	1917	1918	1917	1918
January	$241,793,282	$233,942,081	$613,324,582	$504,797,306	$371,531,300	$270,855,225
February	199,479,996	207,715,540	467,648,406	411,361,970	268,168,410	203,646,430
March	270,257,139	242,162,017	553,985,699	522,900,238	283,728,560	280,738,221
April	253,935,966	278,981,327	529,927,815	500,442,906	275,991,849	221,461,579
May	280,727,164	322,852,898	550,063,934	550,924,791	269,336,770	228,071,893
June	306,622,939	260,350,071	573,653,117	483,799,399	267,030,178	223,449,328
July	225,926,352	241,462,637	372,758,414	507,467,769	146,832,062	266,005,132
August	267,854,767	272,257,387	489,997,171	529,277,566	222,142,404	256,279,192
September	236,196,898	262,257,387	455,997,947	549,828,302	219,801,049	287,570,915
October	221,239,405	246,763,586	543,232,000	503,099,465	321,992,595	256,332,879
November	220,533,575	251,008,037	488,240,626	522,272,604	267,707,051	271,264,567
December	227,911,497	210,979,000	600,135,006	566,007,000	372,223,509	355,028,000

remark, cotton, cotton cloth, wheat, corn, flour, iron and steel and manufactures, mineral oils, many articles in the provisions schedule, etc. This will suffice for this phase of the subject, as it is not our purpose to go into any extended consideration of prices today, as we have had an illuminating illustration of inflation as a very potential factor in the latest year. For example, we note that notwithstanding a quantitative decrease in the exports of cotton of about 25% for the twelve months ended June 30, the value of the outflow was 22% greater than in 1916-17; similarly a drop in corn on the one side of nearly 40% and a gain on the other of 4%; steel rods for ten months, 7% under and 45% over; pipes and fittings, 25% below and 27% above; tin plates, a little less and 105% more; mineral oils, 1% smaller and 33% greater, and this only scratching the surface. . . .

Needless to say, higher prices figure prominently in the imports also, as a factor in the augmentation in value. Without going into any more detailed analysis of the figures, we believe ourselves to be well within bounds in stating that all of the gain in the value of the inflow in 1917-18 over 1916-17 can be thus explained. At any rate, the advance in the price of wool accounts for 54 million dollars; fiber and manufactures, 40 millions; raw silk, 16 millions; breadstuffs, 25 millions; tin, 16 millions, or 151 million dollars in these five articles, or over one-half the aggregate gain for the 10-month period. These illustrations would seem to warrant us in assuming, with prices relatively high for almost all other articles imported, that the whole gain this year was a matter of prices. It is possible to go even further, and say that the quantity of goods brought in was less than in 1916-17, but we had to pay more for them.

BUILDING OPERATIONS

New Construction.—The 1918 figures of new building construction, as judged by the permits issued for 20 leading cities as compiled in Babson's "Desk Sheet," give unmistakable evidence of the continuation of the tendency described in the last issue of the YEAR BOOK (p. 305), the year's total to date having declined much below the unusually low figure of 1917. For the first nine months of 1918 such operations aggregated only $201,830,973, as compared with $334,018,459 for 1917, and $476,439,950 for 1916. The figure for 1918 thus shows a decline of nearly 40 per cent. as compared with 1917, and over 57.7 per cent. as compared with 1916. Even when compared with the low returns for the three years 1913-15, the 1918 figures show a decline of over 40 per cent. In fact, for 1918 the figures declined progressively as the year drew toward a close. For September the operations in the 20 leading cities totaled $18,461,618, or only 63 per cent. of the corresponding total for 1917, and only 45 per cent. of that for 1916.

BUILDING CONSTRUCTION

(20 Leading Cities)

	1917	1918
January	$34,310,911	$21,156,558
February	32,416,653	17,315,219
March	49,480,222	19,048,915
April	47,638,876	28,554,802
May	38,694,360	25,911,866
June	36,762,555	24,316,727
July	33,973,575	24,566,688
August	29,005,502	22,498,580
September	29,199,780	18,461,618
October	23,520,503	11,803,976
November	24,747,221	8,102,283
December	16,980,052	8,462,348

The *Commercial and Financial Chronicle's* compilation is even more extensive, since it covers 160 cities.

For the month of September, 1918, the record shows a total of contemplated outlay of only $36,011,593, as compared with $54,569,892 for 1917 and nearly 72 millions for 1916. The 1918 figure represents a decline of one-third as compared with 1917, and of one-half as compared with 1916. For all of the first nine months of the year the *Chronicle's* record shows the following:

> The aggregate for the period since Jan. 1 is very much less than a year ago, the disbursements arranged for at the same 160 cities reaching the small total of $373,085,628, against 581 millions in 1917 and close to 800 millions in 1916. Greater New York's figures are 48 millions, 87 millions, and 187⅞ millions, respectively, in the three years, and for the other cities collectively the aggregates are 325 millions, 494 millions and 600 millions. Twenty-two cities in New England exhibit a loss of 22 millions (15 millions at Boston) and 39 places in the Middle section (New York City excluded) show a falling off of nearly 30 millions. The Middle West (28 cities) records a diminution in total of 80 millions (22 million Chicago, 8½ million Cincinnati, 11 million Cleveland and 16 millions Detroit), and there is a decline of 4½ millions in the aggregate for 15 Pacific Coast points. The "Other Western" division, comprising 25 cities in the territory west of the Mississippi River, shows a loss of 14 millions; in the South a decline of 9 millions is disclosed.

Government Control of Building Operations. — The reasons for the year's complete inactivity in all sections of the country are similar to those that prevailed in the two preceding years. Shortage of labor, scarcity of building materials, the prevailing high level of prices in nearly all lines affecting construction, the general desire to postpone operations in expectation of a substantial decline in the price of building materials, the congested condition of the railroads, and the great uncertainty concerning realty values, have all continued to exert their adverse influences. But importance must also be attached to the fact that war work has to an increasing extent taken precedence over that for civilians. To this end the War Industries Board issued instructions during the year to the various state Councils of National Defense with reference to the curtailment of unnecessary building operations. According to the arrangement, the non-war construction section of the Priorities Division of the War Industries Board is empowered to grant or withhold permits. This plan necessarily proved effective since the Board is enabled to enforce its rulings through control of priorities and pledges secured from manufacturers not to supply material for any unauthorized projects. (See also XX, *Civil Engineering.*)

BUSINESS FAILURES

A New Solvency Record.—Solvency statistics continue to show an exceedingly satisfactory condition of the nation's mercantile and industrial life, and clearly show that trade and industry have succeeded in successfully adjusting themselves to the numerous changes necessitated by war with comparatively little permanent unsettlement. In fact, for the month of September, the latest for which final figures were available at the time of writing, insolvencies were reported by the *Commercial and Financial Chronicle* to be "the smallest of any month in practically nineteen years," and that "on but five occasions since monthly statistics were first compiled in 1894, have so few defaults been reported." Moreover, for the first nine months of the year the exhibit is the best as regards number of failures since 1906, and the best as regards the amount of debts involved since 1909. This excellent situation is attributable mainly to very active business at high prices, the successful completion of the readjustment of business to war conditions, and the vast Government expenditures.

Number and Liabilities of Failures.—In 1917 the total number of business failures, using Babson's average of the Dun and Bradstreet compilations, amounted to only 13,469, as compared with 16,745 in 1916, and the total liabilities of failures to only $174,131,992, as compared with $183,526,001. The first nine months of 1918 show an even more favorable situation. The total number of failures aggregates only 7,796, as compared with 10,410 for the corresponding period of 1917, a decrease of 25.1 per cent. Total liabilities for the nine months aggregate $114,903,035, as compared with $134,012,331 for the corresponding months of 1916, a decline of nearly 14.2 per cent. These decreases are all the more remarkable when we recall that the number of business failures in 1917 shows a decline of 19.5 per cent. as compared with 1916, and the total liabilities a decline of five per cent. A further analysis of the figures shows the favorable situation in solvency statistics for 1918 to apply to all the main divisions of business activity—manufactures (see also XVIII, *Manufactures*), commerce and finance. The excellent situation at present is well summarized by the *Commercial and Financial Chronicle* in the following statement:

> The mercantile mortality returns for the nine months depict even more clearly than do those for the third quarter the excellent general situation of the current year, the natural outcome of the activity observable in almost all lines and the greatly enhanced profits. Defaults for the period this year reached only 8,069 against 10,737 in 1917 and 13,250 in 1916, and the liabilities involved were but $122,975,024, against $141,950,038 and $154,586,707 respectively. Trading lines show up very well, the aggregate indebtedness reported having been only $45,448,092, against $54,078,771 in 1917, practically every section of the country exhibiting some decrease, with the falling off notably large in the South Atlantic and South Central groups of States. Manufacturing debts at $51,535,309 were also well below those of a year ago, notwithstanding some increase in liabilities in the Central East and in sections west of the Mississippi, contraction having been conspicuously heavy in New England and the Middle Atlantic division. Among brokers, agents, etc., a moderate decrease in liabilities is reported—$26,171,023 comparing with $28,180,025, a great decrease in Oregon and Washington more than offsetting marked expansion in debts in New York and Massachusetts. Bank, etc., suspensions for the nine-month period were decidedly smaller in number than in 1917—in fact only 15 against 42—and the sum represented this year was only as one to four—$4,619,887 against $18,451,964. In most of the States no stress whatever among banks is to be noted, and insolvencies for mentionable amounts are reported from Georgia and Missouri only.

RAILROAD EARNINGS

Gross and Net Earnings. — This business barometer again serves to indicate, to a much greater degree than heretofore, the huge volume of the nation's business and the disastrous effects of rising costs upon industries not in a position materially to advance the price of their services. As pointed out by the *Commercial and Financial Chronicle*:

> The result is so extremely bad, the falling off (in net earnings) being of such great magnitude both in amount and in ratio, that no parallel to it can be found in the past annals of the railroads, and doubt may well be expressed that any parallel to it will be found in the future, the present extremely bad showing standing as a record for all time to come.

The *Commercial and Financial Chronicle's* classified compilation of gross and net earnings of 233,133 miles of road shows that gross earnings for the six months ending June 30, 1918, exceeded those for the corresponding months of 1917 by no less than $181,848,682, the total increasing from $1,889,489,295 to $2,071,337,977, or 9.63 per cent. Such a showing in the gross leaves little to be desired when we reflect that it follows the tremendous gain of 205 millions, or 11.78 per cent., for the first half of 1917 over the similar period of the preceding year, which, in turn, represents the tremendous gain of 328 millions, or 23.37 per cent. over the first six months of 1915.

These large gross earnings, however, lose their apparent significance, even more than in former recent years, when we analyze the expense and net-earnings items. Here the *Chronicle's* compilation shows an augmentation in expenses for the first half of the year by the unprecedented sum of $457,054,265 (34.65 per cent.), owing particularly to higher wages, but also to a great extent to the enhanced prices of practically all materials and equipment entering into railway operations. As a result, we have the anomaly of an increase of 182 millions in the gross converted into a prodigious reduction in net earnings of $275,205,583 (from $540,911,505 to $265,705,922), or 50.88 per cent., as compared with a reduction during the corresponding period of 1917 of only $7,155,748, or 1.26 per cent.

Unfavorable Operating Conditions. —To ascribe such an unparalleled bad showing solely to Government

BUSINESS FAILURES

(Average of Dun and Bradstreet as per Babson's Reports)

	LIABILITIES		NUMBER		Totals for Year	Liabilities	Number
	1917	1918	1917	1918			
January	$22,296,461	$17,985,556	1,549	1,197	1908	$259,341,727	14,873
February	14,302,383	12,148,858	1,146	949	1909	146,763,569	12,430
March	14,448,505	14,806,451	1,189	990	1910	195,223,045	12,109
April	11,905,288	13,365,775	1,083	869	1911	189,358,591	13,062
May	12,943,227	11,101,168	1,245	836	1912	202,085,974	14,647
June	14,872,802	9,217,365	1,113	776	1913	282,232,584	15,296
July	17,164,738	11,329,086	1,093	779	1914	358,391,742	17,526
August	15,772,040	8,611,410	1,074	734	1915	294,399,713	20,600
September	11,100,745	16,337,366	920	666	1916	181,855,903	16,747
October	13,065,656	12,481,988	1,046	674	1917	174,927,350	13,471
November	12,314,290	11,728,826	970	560	1918	150,608,549	9,655
December	14,741,215	11,494,700	1,043	625			

operation and control, as has been attempted by various parties, would be clearly an injustice. On the contrary, most extraordinarily unfavorable conditions prevailed during the winter of 1917-18, which would in any case, irrespective of the nature of control, have caused a great shrinkage in net earnings. A brief summary of these conditions will make this point clear. In the first place, the railroads east of the Mississippi and north of the Ohio and Potomac Rivers began the year in a state of congestion never before experienced in the nation's history. To make matters worse, low temperatures and heavy blizzards proved the most unfavorable in a generation, thus complicating still more the clearing of the vast accumulated mass of freight. Then as a climax came the coal famine, which prevailed all through the eastern and middle states and which finally compelled the Fuel Administrator to resort to the extreme measure of compelling a virtual shutdown of manufacturing plants, retail stores, and most other activities throughout all of the eastern half of the country by denying all use of fuel during certain designated periods (see *A. Y. B.*, 1917, p. 26; and I, *War Organization*). Likewise, to expedite the movement of coal the Railroad Administration was also forced to place embargoes on various classes of freight and to route other classes over special lines. Combining the demoralizing effect of all these factors with the huge advance in wages (see XV, *Labor;* and XIX, *Railroads*) authorized by the Government (amounting to as much as 50 per cent. for employees receiving the lowest wages and estimated to exceed a total of 300 millions), it is not at all surprising that net earnings for the first six months should have been cut in half, and that certain leading eastern systems should have failed to earn even their ordinary operating expenses. As a matter of fact net earnings during June fell over 66 millions, or 79.59 per cent.

The Railroads under Government Control.—The solution of the acute railroad problem described in the last issue of the YEAR BOOK (p. 308) was the Government's assuming control of the railroads on Dec. 28, 1917 (see I, *War Organization*, and XIX, *Railroads*). In brief, the plan possessed the merit of guaranteeing the income of the railroads taken under control, irrespective of the actual showing, and of ending the demoralizing liquidation of railway stocks and bonds in the security market.

To meet the greatly increased payrolls and advanced cost of fuel and other railway materials, the Government at the end of May ordered a sweeping increase of 25 per cent. in the freight schedules, at the same time advancing passenger fares from the prevailing basis of 2¼ and 2½ to 3 cents a mile (see also XIX, *Railroads*). Total revenues, it was estimated, would be swelled by these advances to from 800 to 900 millions. The increased rates, however, did not become operative until the latter part of June and were thus first reflected in the July earnings. For this month a very noteworthy improvement oc-

RAILROAD GROSS AND NET EARNINGS

(*Commercial and Financial Chronicle*)

Section or Group			Gross Earnings			
			Jan. 1 to June 30		Increase(+) or Decrease(−)	
			1918	1917	Total	Per Cent.
Group 1 (8 roads), New England...			$90,363,306	$85,034,219	+5,329,087	6.27
Group 2 (35 roads), East and Middle			563,823,015	513,182,652	+50,640,363	9.89
Group 3 (29 roads), Middle West..			244,295,710	224,408,504	+19,887,206	8.86
Groups 4 and 5 (35 roads), Southern			292,912,533	245,890,005	+47,022,528	19.12
Groups 6 and 7 (29 roads), Northwest			428,315,218	406,678,118	+21,637,100	5.32
Groups 8 and 9 (46 roads), Southwest			324,049,168	295,245,178	+28,803,990	9.78
Group 10 (12 roads), Pacific.......			127,579,027	119,050,619	+8,528,408	7.14
Total (194 roads)............			$2,071,337,977	$1,889,489,295	+181,848,682	9.63
	Mileage		Net Earnings			
	1918	1917				
Group 1.......	7,385	7,528	$3,656,874	$20,965,063	−17,308,189	82.56
Group 2.......	28,242	27,900	29,966,957	125,004,703	−95,037,746	76.03
Group 3.......	21,228	21,233	24,971,466	53,803,395	−28,831,929	53.95
Groups 4 and 5.	38,015	37,810	59,489,656	79,755,527	−20,265,871	25.54
Groups 6 and 7.	65,939	65,755	50,978,029	123,507,674	−72,529,645	58.72
Groups 8 and 9.	55,814	55,065	65,873,800	91,749,634	−25,875,834	28.20
Group 10......	16,510	16,421	30,769,140	46,125,509	−15,356,369	33.29
Total......	233,133	231,712	$265,705,922	$540,911,505	−$275,205,583	50.88

curred, as compared with the preceding year. Gross earnings increased by $117,661,315, or 34 per cent., and net earnings by $34,466,131, or 31.36 per cent. But this excellent improvement soon served as the basis for further wage increases by the Railroad Administration, the last increase applying to trackwalkers, clerks and similar classes of employees (see also XV, *Labor;* and XIX, *Railroads*), involving an added annual outlay estimated at from 100 to 150 millions and this in addition to previous increases estimated at 300 millions. As a consequence, the month of August, the last for which data are obtainable at the time of writing this account, shows that a further substantial increase in the gross earnings is reflected to only a small extent in the net revenues. In other words, while this month shows an increase of gross income (as compared with the same month of 1917) from 362 millions to 498 millions, or 37.45 per cent., expenses rose by 111 millions, or over 45 per cent. As a result, net earnings increased only 24 millions, a comparatively small salvage out of the 136 millions of improvement in gross earnings.

Reference may be made also to Babson's compilation for 10 leading railway systems, representing every section of the country. This shows gross earnings for the first eight months of 1918 to be $12,962 per mile, against $11,089 for the same months of 1917, an increase of nearly 17 per cent., this following an increase of 15.3 per cent. during the same period of 1917 as compared with the corresponding months of 1916. Net earnings for the first eight months of 1918, however, stand at only $2,403 per mile, against $3,287 for the same months in 1917, a decrease of nearly 27 per cent.

NET SHORTAGE OF CARS

	1916	1917	1918
Jan. 1...	s46,955	62,247	89,995
Feb. 1...	s21,485	109,988	98,044
Mar. 1...	20,551	130,082	138,102
April 1...	s3,650	144,797	[1]
May 1...	s33,361	148,627	....
June 1...	s57,693	105,127	....
July 1...	s52,234	77,682	....
Aug. 1...	s9,762	33,776	....
Sept. 1...	19,873	34,605	....
Oct. 1...	60,697	70,380	....
Nov. 1...	114,908	140,012	....
Dec. 1...	105,527	117,132	....

[1] Publication discontinued. s = net surplus.

Car Shortage. — Unfortunately, the discontinuance of the reports of idle-car figures by the American Railway Association in March prevents us

BANK CLEARINGS

	Bank Clearings Outside of New York		Total Bank Clearings	
	1917	1918	1917	1918
January	$10,513,140,000	$11,819,506,000	$25,640,505,000	$26,538,574,000
February	8,835,386,000	9,998,003,000	21,629,473,000	22,257,359,000
March	10,563,287,000	12,244,518,000	24,792,415,000	26,084,800,000
April	10,360,027,000	12,391,579,000	25,012,249,000	26,485,086,000
May	10,733,054,000	12,709,536,000	26,316,511,000	28,269,236,000
June	10,635,269,000	12,457,026,000	26,734,348,000	27,314,671,000
July	10,479,033,000	13,243,583,000	25,664,327,000	28,644,789,000
August	10,413,909,000	13,197,733,000	25,093,230,000	28,156,159,000
September	10,145,435,000	12,709,081,000	24,029,336,000	26,372,958,000
October	12,535,211,000	15,150,894,000	28,258,604,000	32,066,173,000
November	12,391,781,000	13,733,734,000	27,225,956,000	29,339,560,000
December	11,917,006,000	14,151,653,000	26,530,549,000	30,810,729,000

from using this barometer as indicating the immense volume of the year's railway traffic. Suffice it to say that all indications point to the severe shortage of cars described in the Year Books for 1917 (p. 309) and 1916 (p 331). As pointed out last year, an average net surplus of 217,000 cars for the year 1915 had been converted into a net shortage of nearly 92,000 cars by the beginning of October, 1917. For March, however, the last month of 1918 for which these figures are obtainable, the net shortage stood at 138,000 cars.

BANK CLEARINGS

Total Clearings. — The year 1916 (*A. Y. B.*, 1916, p. 331) showed a remarkable increase in bank clearings over 1915 and 1917 (*A. Y. B.*, 1917, p. 309) recorded another tremendous increase over 1916. The year 1918 to date furnishes another substantial increase and new high records for both New York City and for the rest of the nation. For the month of October the *Commercial and Financial Chronicle's* compilation shows total clearings of $32,078,491,881, as against $28,264,308,306 in October, 1917, an increase of 13.5 per cent. But the October record of 1917, it should be remembered, represented a gain of 10.1 per cent. over October, 1916, and 150 per cent. over October, 1914. For the first 10 months of 1918 clearings aggregated $272,200,796,474, as against the 1917 high record for the same months of $253,177,157,266. Thus far, therefore, the year 1918 represents a gain of 17.5 per cent. over 1917, but 1917, in turn, showed a gain of 21.4 per cent. over 1916, 70.9 per cent. over 1915, and 93.1 per cent. over 1914. (See also XIII, *Banking and Currency.*)

Clearings Outside New York.—As was the case in 1917, the gain of 1918 is fairly well distributed throughout the year and is not confined mainly to New York City, as is so often the case. Exclusive of New York City, clearings for October, 1918, totaled $15,163,212,635, a gain of no less than 20.9 per cent. over the corresponding month of 1917; but the October, 1917, showing represented a gain of 25 per cent. over 1916, 69 per cent. over 1915, and 105 per cent. over 1914. For the first 10 months of 1918 gains were especially large at such important and widely distributed centers as Pittsburgh (increase of 38.6 per cent), Baltimore, (41.4 per cent.), Boston (24.4 per cent.), Cincinnati (37.5 per cent.), Seattle (63.8 per cent.), Portland (53.2 per cent.), Tacoma (54.9 per cent.), Kansas City (39.6 per cent.), Omaha (58.8 per cent.), Denver (37.7 per cent.), Duluth (30.4 per cent.), New Orleans (42.1 per cent.), Richmond (68.7 per cent.), Atlanta (73.6 per cent.), Nashville (42.2 per cent.), Norfolk (40.9 per cent), Birmingham (61.7 per cent.) and Dallas (43.7 per cent.). The largest gains are recorded for the New England, Pacific and southern sections. For the first 10 months total clearings for the New England district showed an increase of 20.9 per cent. as compared with the first 10 months of 1917; for the Pacific district, 21.6 per cent.;

and for the South, 30.4 per cent. In the middle eastern section, however, the clearings for 1917 show an increase of only 1.7 per cent., and for the middle western section, of only eight per cent.

For the first 10 months of the year, clearings exclusive of New York City totaled $125,932,450,222, a gain of 10.7 per cent. over 1917, but the 1917 record represented a gain of 30 per cent. over 1916 and of approximately 74 per cent. over 1915 and 1914. Although bank clearings exclusive of New York City are generally regarded as the best single barometer of general business conditions, it is only fair to note, as has been done in the last three issues, that such clearings are materially affected by rising commodity prices. The later discussion of index numbers will serve to show, as it did in previous accounts (*A. Y. B.*, 1916, p. 341; 1917, p. 310), that the enormous rise in the price level of nearly all commodities has greatly increased the volume of checks cleared.

Clearings in New York.—At New York City, bank clearings amounted to 146¼ billions for the first 10 months of the year, as compared with 148 billions for the corresponding period of 1917. This amount actually represents a decline of slightly over one per cent. over the corresponding period of 1917. New York City, in other words, has not shared the same increase already noted for other sections of the country, thus again emphasizing the importance of considering New York City separately when interpreting the nation's bank clearings, particularly because it is the great stock-, bond-, and produce-market center of the country. Produce and cotton prices have ruled extremely high in 1918, but any gain in this direction was more than balanced by the decrease in the price level, as well as in the volume of transactions, in the security market.

THE SECURITY MARKET

General Conditions.—It is an axiom of Wall Street that the organized security market discounts important business changes, and the year 1918 probably affords one of the best illustrations on record. Previous issues of the YEAR BOOK have chronicled the spectacular price movements of various classes of securities during 1914-17. Using Babson's classification, it appears that during this period the high for 20 representative rails (109.10) and 20 representative industrials (106.81) was reached in December, 1916; for 20 coppers (66.5), in November, 1916; and for 20 representative bonds (94.0), in January, 1917. These price levels, it is now clear, preceded the unprecedented boom of 1917 and 1918. But by way of contrast, right in the midst of the record-breaking business of 1917, the stock and bond market experienced one of the greatest declines in a generation (*A. Y. B.*, 1917, p. 310). In fact, all of 1917 was marked by constant and, at times, violent liquidation, until at the end of the year stocks showed a shrinkage of fully 25 per cent. from their previous highs. The 20 rails referred to above reached a low of 70.75 in December, the 20 industrials a low of 65.95, the 20 coppers a low of 35.4, and the bonds the extraordinary low of 79. Since the close of 1917 the market, as will be pointed out later, has been in the main dull and steady, and the monthly averages have shown comparatively little variation, although business continued at top speed. To all appearances the violent liquidation of 1917 had run its course by the close of that year.

With the signing of the armistice the security market was expected by many to manifest great buoyancy. But the extent to which the market permitted itself to celebrate this great event was totally out of accord with the unprecedented celebration elsewhere. What appreciation did occur in stock prices took place during the month preceding the definite signing of the armistice on Nov. 11. Thus, to quote Babson's summary, under date of Dec. 3, the 20 representative rails show an appreciation of only 0.06 of a point since Sept. 30, the date of Bulgaria's withdrawal from the war; the 20 representative industrials show a loss of 4.52 points for the same period, and the 20 coppers a loss of 1.5 points.

SECURITY MARKET TRANSACTIONS AND PRICES

(New York Stock Exchange)

	Total Transactions				Average Security Prices			
	Shares of Stock		Bond Sales		10 Leading Stocks[1]		10 Leading Bonds[1]	
	1917	1918	1917	1918	1917	1918	1917	1918
January....	$16,939,440	$13,616,357	$124,612,000	$106,796,500	137.9	109.7	93.9	80.0
February...	13,588,465	11,418,079	76,087,000	83,821,500	132.4	108.9	92.6	80.4
March.....	18,658,267	8,419,477	75,344,000	121,102,500	133.9	108.3	92.0	79.8
April.......	14,258,162	7,404,174	96,778,000	127,549,000	131.2	106.1	90.3	79.7
May.......	19,354,400	21,139,092	77,223,500	164,979,500	125.6	109.9	88.0	81.0
June.......	19,092,653	11,772,261	58,203,700	137,925,000	123.1	111.0	87.3	79.8
July.......	13,325,365	8,449,888	63,866,500	118,760,500	121.2	109.5	87.1	79.7
August.....	11,636,853	6,887,589	68,579,000	163,698,000	123.1	110.7	86.4	79.6
September..	13,822,775	7,763,068	85,201,500	176,211,000	118.6	110.7	85.0	78.4
October....	17,368,787	20,671,337	121,057,000	246,828,000	113.4	113.5	84.0	80.7
November...	14,816,058	14,651,841	98,124,000	230,933,000	109.9	114.2	81.8	85.6
December..	12,767,723	11,925,303	112,167,000	384,223,000	108.8	112.9	79.6	85.5
Total, 1910.	$164,150,061							
1911.	127,207,258							
1912.	131,128,415							
1913.	83,470,693							
1914.	47,900,568							
1915.	173,145,203							
1916.	233,311,993							
1917.	185,628,948							
1918.	144,118,469							

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[1] Babson's list.

Even had there been a desire to take advantage of the situation, speculation for the rise would in all probability have been checked by the monetary situation. Financial leaders have repeatedly called attention to the necessity of rigidly limiting the use of credit for speculative purposes. In this respect, shortly after the signing of the armistice, the Money Committee representing the leading banks insisted upon a 30 per cent. requirement for brokers' margins, a policy acquiesced in by the Stock Exchange governors (see also *infra*, and XIII, *Banking and Currency*).

The above figures, however, do indicate a readjustment in prices as between rails and industrials, a movement that has been gradually going on for some time and that has been the subject of much comment in the financial press. The war stocks seem to have suffered most, no doubt because of the knowledge that the return of peace means an end to their extraordinary profits. Railway and public-service shares have, on the contrary, displayed independent strength. Their position, it is argued, is different in that they will benefit from a decline in commodity prices, which, despite any anticipated business depression, will reduce operating expenses in a ratio greater than the reduction in the volume of business handled.

Volume of Stock Transactions.—The small total of stock-market transactions of 1918 stands in striking contrast to the enormous volume of 1916 and 1917. From the security market standpoint, 1915 and 1916 are to be remembered chiefly for the speculative craze to buy anything that was labelled "war stock"; the large trading of 1917, on the other hand, took place on rapidly declining prices, the level for many groups of investment stocks closing the year at lower than panic prices. By the close of the year, however, the liquidation seems to have spent its main force. Since that time, in fact throughout all of the first 10 months of 1918, the stock market has been dull and steady, and has given every appearance of a thoroughly liquidated condition. No doubt, true to its record of the past, the violent declining market of 1917 discounted the readjusted business conditions that will follow the coming of peace.

For the first nine months of the year 1918 shares traded on the New

York Stock Exchange totaled only 96,869,985, a decline of over 31 per cent., as compared with the immense transactions for the corresponding period of 1917, and 30 per cent. when compared with 1916. For five of the nine months of the year the monthly average amounted to less than 8½ million shares, a figure never even approached during any month of the preceding year.

Stock Prices. — The steady and liquidated character of the security market may be illustrated by Babson's composite quotations for different groups of selected stocks. As regards his list of 10 representative railroad stocks, the average monthly price rose during the first 10 months of 1918 from 109.7 (for January) to 112.1 for October. For the whole 10 months the average stands at 109.4, as compared with 109.9 and 108.8 for November and December of 1917. In other words, the price change has been inappreciable on the average. With the exception of April, when the average dipped to 106.1, two of the 10 months averaged between 108 and 109, three other months between 109 and 110, four other months between 110 and 111, and the last month (October), 112.1. This price of 112.1 compares with 113.4 for October, 1917; 137.9 for January, 1917; 143.3 for January, 1916; 133 for January, 1915; 159.8 for January, 1913; and 174.8 for January, 1910. It may be added that public-service stocks of all kinds also shared a similar depreciation. The primary cause of the continued low price level has no doubt been the tremendous increase in the cost of all that is needed for operation. The scarcity of funds, however, for stock-market purposes, owing to the heavy flotation of Liberty bonds, also constitutes an important reason for the inactivity and continued low price level of the market.

Taking Babson's composite price for 40 stocks, including 20 representative industrials and 20 representative railroads, it appears that the average price increased during the first 10 months of the year from 77.53 (average for January) to 87.62 (average for October), or 13 per cent., a recovery of about one-half of the decline experienced in the same stocks during the corresponding months of 1917. For the entire ten months the average price of these stocks is 80.97. as compared with 94.52 for 1917. This price of 80.97 compares with 100.46 during January, 1917, a high record of 108.25 during November, 1916, and 73.15 during December, 1914, the first market month following the closing of the New York Stock Exchange as a result of the outbreak of the European War.

Again, taking Babson's composite price for 20 representative copper stocks, we find that the average price for October of 1918 is 42.6, or about the same as the price of 43.4 for the same month of 1917. Here again the steady and liquidated character of the 1918 market is indicated by the facts that the average price for the entire ten months is 40.6, against 41.1 for the last month of 1917; and that with the exception of October, when the price averaged 42.6, every monthly average ranged between a minimum of 39.7 and a maximum of 41.3. The average price of 42.6 for October compares with 53.6 during January, 1917, and a high of 62.2 during November, 1916.

Bond Sales and Prices.—During the first nine months of 1918, bond sales on the New York Stock Exchange aggregated $1,200,843,500, as compared with $725,842,200 during the corresponding period of 1917 (an increase of nearly 66 per cent.), 797 millions in 1916, 605 millions in 1915, and 383 millions in 1913. The remarkable increase in the 1918 volume, however, is to be attributed chiefly to the large transactions in American and foreign Government loans, it being estimated that these contributed about three-fourths of the total. According to the press, the first week in November of 1918 established a high record for bond sales in the New York market, more than $70,000,000 changing hands. A considerable part of the dealings was due to the listing of the Fourth Liberty Loan issue, but much of the activity was also derived from the increasing strength of the inquiry for speculative railway bonds. Moreover, at various times during the year different leading foreign Government issues developed great activity, either on a rapid decline or a rapid rise, according as the fortunes of war favored one side or the other.

With reference to the price level, the bond market of the year represents, in the main, the same steady and liquidated character already noted in the case of stocks. Using Babson's representative list of 10 highest-grade and 10 second-grade bonds, the average price for the first 10 months stands at 79.8, as compared with 79.5 for the last month of 1917, thus showing comparatively little change. The October price of 82.1 compares with 80.0 during January of 1918, 93.9 for January of 1917, 91.8 during January, 1916, and 99.8 during January, 1910. Last year's account showed (p. 314) that the drastic decline of 1917, from 93.9 in January to 79.5 in December, or over 15 per cent., was due to numerous causes, among the principal of which were the rapidly increasing cost of living, the rising tendency of long-term money rates, and the flotation of large foreign and domestic war issues in this country on an attractive interest basis with the prospect of further issues. The splendid opportunities for investment in foreign bonds seem no longer present, but the continued high cost of living and the limited volume of available funds are still exerting their influence, particularly in the non-speculative, low-interest issues.

New Securities Listed. — Liberty-bond flotations and Government restrictions upon new capital issues (see *The Conduct of Business*, *infra*) were chiefly responsible in bringing the total of new listings on the New York Stock Exchange of stocks and bonds of private corporations almost to the point of extinction. For the first nine months of the year such listings (excluding the listings of Liberty Loan bonds) totaled only $291,540,975, as compared with $2,217,064,629 for the corresponding months of 1917, $1,308,300,975 for 1916, $666,482,950 for 1915, and $840,507,300 for 1914. Expressed in percentages, the listings of 1918 to the end of September amount to only 13 per cent. of the total for the corresponding period in 1917, and to only 22 per cent. of the total for 1916.

LISTINGS OF NEW SECURITIES

	1917	1918
January	$182,582,400	$164,674,300
February	213,872,600	69,886,300
March	312,115,800	74,874,000
April	130,141,500	23,853,000
May	48,320,500	102,348,300
June	59,637,400	253,786,800
July	135,282,000	165,580,000
August	185,946,000	89,514,800
September	80,809,600	59,660,500
October	49,205,000	76,291,000
November	90,520,400	89,768,200
December	41,537,000	174,572,900

Total, 1909	$2,439,656,870
1910	1,678,147,570
1911	1,329,616.345
1912	1,786,986,170
1913	968,738,315
1914	964,157,200
1915	1,172,078,320
1916	1,991,735,075
1917	2,324,347,229
1918	1,344,810,100

The year's low record represents a continuation of the sudden slump that occurred in August, 1917 (*A. Y. B.*, 1917, p. 315). For the first seven months of that year, listings totaled the huge sum of $2,170,561,850, every month exceeding 200 millions, and January and July considerably exceeding the 400-million mark. In August, 1917, however, the total dropped suddenly from $486,985,800 (July) to $22,502,779. Since that time the monthly averages have remained woefully small, in fact, falling below four millions in November, 1917, and below six millions in February, 1918. For the last 14 months (August, 1917, to September, 1918, inclusive) listings have aggregated only $445,325,754, or only about one-fifth of the total for the first seven months of 1917, and 41 millions less than the figure for the single month of July of that year.

INCORPORATIONS

Incorporations. — Last year's account (*A. Y. B.*, 1917, p. 315) related the phenomenal increase in the flow of funds into the numerous lines of industry helping to conduct the war, and the resulting impetus given to the creation of many new corporations in so-called war industries. But in 1918, owing to the flotation of billions in Liberty bonds and the drastic restrictions placed by the Govern-

INCORPORATIONS OF $1,000,000 AND OVER

	1918	1917	1916	1915
January	$209,285,000	$244,450,000	$270,995,000	$51,150,000
February	120,650,000	283,815,000	365,995,300	53,950,000
March	128,620,000	281,000,000	194,750,000	70,050,000
April	169,375,000	361,510,000	166,650,000	32,200,000
May	213,372,500	388,481,000	209,735,000	78,950,000
June	144,400,000	352,584,000	264,350,000	181,247,100
July	90,725,000	416,350,000	217,662,500	71,100,000
August	77,975,000	382,100,000	113,472,000	67,100,000
September	132,925,000	202,500,000	164,700,000	286,625,000
October	57,665,000	308,513,700	303,768,700	208,695,000
November	94,260,000	285,590,000	260,407,800	190,075,000
December	68,200,000	186,350,000	230,850,000	135,125,000
Total	$1,507,452.500	$3,693,243,700	$2,763,336,300	$1,426,267,100

ment upon new capital issues (see *The Conduct of Business, infra*), the total is unusually small. New incorporations with an authorized capital of $1,000,000 or over in the eastern states are reported as aggregating only $1,287,327,500 during the first nine months of 1917, as compared with the stupendous total of $2,912,790,000 for the corresponding period of 1917, and with $1,968,309,800 in 1916. The extraordinary character of the decline for 1918 becomes apparent when we realize that it amounts to less than one-half the total recorded for the preceding year.

New Securities Issued. — New securities issued by existing corporations during 1918 also show a substantial decline as compared with 1917, despite the fact that that year also showed a tremendous falling off as compared with 1916. The continued decline in new financing is again principally due to the flotation of the huge issues of Liberty bonds and the Government's policy of conserving the supply of investment capital by requiring the approval of all applications for new capital in excess of $100,000, thus enabling the Government to insure the better success of its own issues and to limit the flow of other available funds to channels connected with industries essential to war work.

For the first nine months of 1917 new securities issued by existing corporations totaled only $1,004,178,000, as compared with $1,348,707,800 for the corresponding period of 1917, $1,712,826,300 in 1916, and $973,550,600 in 1915. In other words, the showing for 1918 represents a decline of $344,529,000, or 22.2 per cent., as compared with 1917, and of $708,648,000, or 41.3 per cent., as compared with 1916. But this poor showing is not at all surprising when we consider the huge private loans made to foreign borrowers preceding our entrance into the war, the reduction of our indebtedness abroad by several billions through the repurchase of American securities held in foreign countries, and the flotation of Liberty bonds of approximately eight billions in 1917 and over ten billions in 1918.

THE MONEY MARKET

Money Rates.—Similar to the experience of 1916 and 1917, money-market conditions during 1918 were the opposite of what might have been expected during a period of great business prosperity and enormous Government borrowing. Although materially higher than in 1917, money rates were never allowed to approach the abnormal. After three years of record-breaking business at abnormally high prices and unprecedented flotation of Government bonds, call loans in New York averaged only 6¼ per cent. for October, and this in the midst of the crop-moving season. Moreover, time loans at no time during the year reached a monthly average in excess of six per cent. The reason for this unexpected situation is to be found principally in the artificial devices adopted by the Government for the prevention of extremely high interest rates. Not only was a Capital Issues Committee created (see *supra*) for the purpose of prohibiting the flow of surplus funds into any channel not considered necessary to the successful prosecution

MONEY MARKET CONDITIONS

	Loans, Deposits and Reserves of New York Clearing House Banks					
	Loans (000 omitted)		Deposits (000 omitted)		Surplus Reserves (000 omitted)	
	1917	1918	1917	1918	1917	1918
January	$2,360,816	$4,036,019	$2,538,631	$3,616,162	$154,692,348	$73,861,560
February	2,407,199	4,164,329	2,587,792	3,577,765	149,449,802	58,631,603
March	2,466,977	4,266,541	2,637,360	3,643,476	124,498,768	43,759,720
April	2,526,256	4,352.582	2,690,613	3,712,461	111,883,715	57,809,878
May	2,490,282	4,479,794	2,568,333	3,662,263	96,923,843	48,746,222
June	2,651,701	4,431,776	2,547,780	3,702,575	58,937,160	74,710,003
July	2,684,303	4,313,769	2,579,223	3,578,882	126,746,478	56,895,978
August	2,693,116	4,411,151	2,602,342	3,583,368	92,985,574	46,743,664
September	2,753,662	4,487,194	2,573,764	3,701,161	64,961,492	42,204,785
October	3,309,681	4,622,480	2,980,770	3,764,679	84,334,415	52,730,675
November	4,417,579	4,664,221	3,393,215	3,747,401	88,531,452	62,410,286
December	4,376,146	4,618,312	3,485,327	3,815,127	104,455,545	61,550,950

	MONEY RATES						GOLD MOVEMENTS (Excess of Imports)	
	New York Monthly Average				Average Bank Rates, England, France and Germany			
	1917		1918					
	Time	Call	Time	Call	1917	1918	1917	1918
January	3½	2	5¾	4⅖	5⅛	5	$38,206,360	$658,010
February	4⅓	2½	5¾	4¼	5¼	5	81,698,436	+2,534,892
March	4½	2¼	6	5⅖	5¼	5	121,578,989	+896,997
April	4½	2⅗	6	4	5	5	15,407,245	+814,357
May	4⅝	2⅔	6	5⅛	5	5	+ 5,435,329	3,021,570
June	5⅛	4⅞	6	5¼	5	5	+24,174,783	29,187,919
July	4⅘	3⅝	6	6⅛	5	5	+41,748,559	+4,985,879
August	5	3	6	6	5	5	+27,357,136	+1,722,296
September	5⅜	4⅞	6	6¼	5	5	+27,160,861	326,907
October	5⅝	4	6	6¼	5	5	+7,004,492	+707,910
November	5½	4	6	6¼	5	5	+4,316,684	+1,127,698
December	5⅝	5¼	6	5¼	5	5	12,527,783	186,000

+ = excess of exports.

of the war, but drastic restrictions were also placed upon Stock Exchange loans (see also *supra;* and XIII, *Banking and Currency*). On Oct. 24 it was announced through the New York Stock Exchange that beginning Nov. 4, banks would require 30 per cent. instead of the usual 20 per cent. margin on loans to brokers, and that brokers, moreover, would have to reduce their loans to the level of Sept. 16. The significance of this ruling becomes apparent when we are informed "that both the prices of stocks and of loans to brokers were, on Sept. 16, near the lowest points of the last six months, while they were on Oct. 24 near the highest point of the year." At the beginning of the year the January average rate on prime commercial paper was 5¾ per cent., and the rate on call loans 4⅖ per cent. Subsequently there was a gradual increase in both rates, until in October the rate on prime commercial paper averaged six per cent., and the rate on call loans 6¼ per cent. At the same time in 1917 the corresponding rates were 5⅝ per cent. and four per cent. As indicated by the accompanying table, there has thus been a gradual and considerable increase in money rates; yet the advance has not been such as would be warranted by the unusual demands of business as well as the Government.

Bank Loans and Deposits. — The most noticeable feature in the banking situation of 1917, using the New York Clearing House Bank statement (exclusive of the trust companies) as a basis, was the enormous expansion in the loan item. This increased from an average of 2,360 millions in January to 4,376 millions in December, while deposits increased only from 2,538 millions to 3,485 millions. During 1918 the loan item never dropped below the 4,000-million mark, and for the month of October averaged 4,659 millions. Deposits, on the other hand, have increased to 3,792 millions. For October the ratio of loans to deposits stood at 123 per cent., as compared with about 128 per cent. in 1917. This great disproportion between loans and deposits should be viewed in the light of the fact that an excess of loans over deposits has usually been regarded as an unwelcome sign in the credit situation. (See also XIII, *Banking and Currency.*)

During 1917 the surplus reserves of New York Clearing House banks had declined, with considerable fluctuation, from an average of 154 millions in January to a low of 59 millions in June, and for December averaged 104½ millions. During 1918 (January to October) the average never exceeded $73,861,560, the figure for January, while during four of the first 10 months the average fell somewhere between 40 and 50 millions. For all of the ten months the average is $55,929,268, as compared with $109,008,798 for the same period of 1917.

PRICES AND COST OF LIVING

Continued Increase in Prices.—The 1917 issue of the YEAR BOOK (p. 318) contained an explanation of the rapid and general upward movement of commodity prices during 1917, coming as it did on top of the material advance during the years 1916 and 1915. During 1918 there has been a further constant and material increase; in fact, every month of the year presents an average price level higher than the highest average shown for any month during the preceding year. At the close of October, 1918, the general price level as indicated by Bradstreet's index number stood 8.07 per cent. higher than in December and 38.5 per cent. higher than in January, 1917. Similar to the experience of the preceding two years, the continuing phenomenon of increasing prices of practically all the necessities of life has been the subject of endless discussion and has been instrumental in securing large wage increases for organized labor without even the semblance of a protracted struggle (see also XV, *Labor*).

INDEX NUMBERS

YEAR	Bradstreet's	London *Economist*	Gibson's
1901	7.57	1948	44.5
1902	7.88	2003	53.5
1903	7.94	2197	49.0
1904	7.92	2136	48.3
1905	8.09	2342	47.3
1906	8.41	2361	49.8
1907	8.90	2508	50.9
1908	8.00	2223	54.2
1909	8.51	2231	59.2
1910	8.98	2407	59.3
1911	8.7129	2542	56.9
1912	9.1867	2699	62.6
1913	9.2115	2704	58.1
1914	8.9985	2643	60.8
1915	9.8531	3244	64.0
1916	11.8235	4216	74.9
1917	15.6386	5418	110.8
1918:			
January	17.9636	5845	118.9
February	18.0776	5785	121.9
March	18.0732	5828	126.1
April	18.4656	5867	130.5
May	18.9133	5941	125.7
June	19.0043	6016	122.7
July	19.1849	6105	123.3
August	19.1162	6128	122.2
September	19.0485	6267	123.2
October	19.0167	6238	119.0
November	18.9110	6210	118.8
December	19.0376	6212	120.9

Index Numbers.—For the month of October, 1918, Bradstreet's index number averaged 19.0167, as compared with 17.9636 in January of 1918, and with 13.727 in January, 1917; 10.9163 in January, 1916; 9.1431 in January, 1915; 8.8857 in January, 1914; and 8.29 in January, 1908. For the first 10 months of 1918 Bradstreet's index number averaged 18.6864, as compared with 15.2996 for the corresponding period of 1917, and 11.4422 in 1916. The average figure for the first 10 months of 1918 represents an increase of 22 per cent. over the corresponding period of 1917, of nearly 63.3 per cent. over the average for 1916, nearly 92.2 per cent. compared with 1915, and 107.3 per cent. over the year 1914.

The *London Economist's* number shows an even greater increase in English prices. For the month of October, 1918, this number averaged 6,238, as compared with 5,845 in January of 1918; 4,908 in January, 1917; 3,634 in January, 1916; 2,800 in January, 1915; 2,623 in January, 1914; and 2,310 in January, 1908. For the first 10 months of 1918 this number averaged 6,002, as compared with 5,354 for the corresponding period in 1917, 4,122 in 1916, 3,027 in 1915, and 2,623 in 1914. The October average figure for 1918 represents an increase of 10.8 per cent. over the figure for the same month of 1917, of 41 per cent. over the average figure for 1916, 87 per cent. over 1915, and 124 per cent. over 1914. Gibson's index number, likewise, averaged 119.9 for October, 1918, as compared with 118.9 in January of 1918; 87.4 in January, 1917; 65.6 in January, 1916; and 58.2 in January, 1914. For the first 10 months of this year the Gibson number averages 123.4, as compared with 110.8 in 1917, 60.8 in 1914, and 54.2 in 1908.

The causes for rising commodity prices are in the main the same as those described in the last issue (p. 318), although during 1918 we have had the benefit of the favorable 1917 crop. In the main, the present price level is attributable to the general inflation brought about by the abnormal extension of credit. But considerable weight must also be assigned to the tendency towards profiteering, to the reduction in the food-producing and manufacturing power of many of the belligerent nations, to the unprecedented foreign demand arising out of the war, and to a scarcity of labor coupled with a large increase in wages. There is also reason to believe, as was pointed out last year, that the rise in prices would have been even greater had the Government not intervened with its policy of regulating prices along many lines (see *infra*) and in supervising the order of shipment of many necessities.

THE CONDUCT OF BUSINESS

Government Price Fixing and Control of Production and Distribution.—The most far-reaching change in our business life during 1918 was the further extension of Government control over the prices, production or distribution of commodities most vital to the prosecution of the war or as necessities of life. Numerous illustrations were mentioned last year (*A. Y. B.*, 1917, p. 319), but it remained for 1918 to witness the extension of Government control to innumerable other industries. Space limits forbid an extended explanation of all the additional numerous applications of this control during the year or a repetition of the reasons actuating the Government (*A. Y. B.*, 1917, p. 319). Suffice it to outline the principal methods adopted by the Government and to illustrate each with a few of the leading examples that have occasioned most discussion in the daily and financial press.

(1) *Restrictions on production, use and purchase of certain commodities.*—The War Industries Board, as an example, imposed detailed regulations governing the manufacture of rubber and felt footwear, thereby eliminating some 5,500 styles; restricted the number of styles and sizes and the character of the tubing and trimming used in the brass-bedstead manufacturing business; limited straw-hat production to essential needs by restricting the styles, height, trimmings and width of brim; regulated the colors and sizes of spool cotton materials; fixed the weight and quantity of paper to be used for textbooks and in weekly, bi-monthly and quarterly publications; and restricted the output of passenger automobiles and repair parts to 25 per cent. of the 1917 production. (See also XVIII, *Manufactures.*)

(2) *Price fixing.*—This is illustrated by the Food Administration's plan to stabilize the price of cotton seed and its products, and the War Industries Board's policy to fix "maximum" prices for the various classes of shoes, for sulphuric and nitric acid, platinum, silver, aluminium, cotton goods, hemp, etc. The 1917 policy of fixing the prices of such leading articles as wheat, sugar, iron, steel, and copper was continued during 1918. (See also XVI, *Agriculture;* and XVIII, *Manufactures.*)

(3) *Restriction on imports and exports.*—The nature of this control was explained fully last year (*A. Y. B.*, 1917, p. 320), and 1918 simply saw numerous modifications and extensions of the list. (See also XIX, *External Commerce.*)

(4) *Licensing of leading industries.*—In September the operations of meat-packing concerns were subjected to Federal license, the regulatory powers to be administered by the

Secretary of Agriculture through the Bureau of Markets; in June stockyard firms and dealers were similarly licensed (see also XVI, *Live Stock*). Other instances of licensing include all users and dealers in pig iron, the plan comprising a complete inventory of all stocks taken and, if necessary, a redistribution of supplies to equalize them according to essential uses; and all persons manufacturing, importing, storing or distributing crude oil, fuel oil, gas oil, kerosene or gasoline whose gross sales exceed $100,000 annually. (See also I, *War Organization.*)

(5) *Pooling of certain commodities.*—This is illustrated by the pooling of the wool clips by growers in the Middle West, East and Southwest and their consignment to distributing centers, all dealers to buy at a price which would enable them to make only 1½ cents a pound. In this particular case all dealers must be approved by the wool section of the War Industries Board. Likewise, dealers in approved distributing centers were limited to a gross profit of only five per cent. (See also XVI, *Live Stock;* and XVIII, *Manufactures.*)

(6) *Prohibition of certain manufactures and business practices.*—A large number of such regulations were formulated from time to time but a few deserve special mention. The practice of selling advertisements in newspapers and periodicals with a guarantee of circulation and a rebate should the circulation fall short of the guarantee was prohibited with a view to preventing the printing of copies not called for by the legitimate circulation. By order of the Director of the Mint, the mints at Philadelphia, Denver and San Francisco and the Assay Office at New York were forbidden to issue gold bars in exchange for coin or gold certificates without a license from the War Industries Board, Federal Reserve Board, or the Secretary of the Treasury, depending on the circumstances of the case. This order practically meant a virtual suspension of the use of gold by manufacturers of jewelry or its use for other arts and craft purposes. All sales of unmanufactured platinum, irridium and palladium were also prohibited except under license, thus restricting their use to war and other essential purposes. Mention should be made also of the prohibition of manufacture and sale of alcoholic beverages (see also XIV, *The Liquor Problem*).

(7) *Control and operation of Transportation Facilities.* — Besides extending its influence over numerous lines of business activity through one or more of the aforementioned methods, the Government also assumed complete control of the nation's important systems of transportation by rail, express, wire and steamboat. This feature is fully described elsewhere (see XIX, *Railroads*).

Produce Exchange Restrictions on Future Dealings.—Although the exchange restrictions of 1917 on trading in wheat, cottonseed oil, coffee and sugar (*A. Y. B.*, 1917, p. 322) were continued, the year 1918 gave some evidence of a distinct tendency in the opposite direction, and of a desire to revoke some of the many rulings of the previous year. This is particularly true in regard to the important matter of maximum prices. In September the Chicago Board of Trade decided, at the request of the U. S. Food Administration, which was reported to have desired a normal volume of speculative trading in futures, to abolish maximum prices on grain and provision futures and to permit all contracts to run to maturity. Relative to this action of the Board, the *Chicago Herald and Examiner* declared it to be "one of the most important since the war, and is a big victory for those members of the Exchange who have held right along that buyers and sellers should be obliged to live up to their contracts, except where it is shown there is evidence of manipulation." It is also interesting to note that speculation in barley for future delivery was begun on the Chicago Board of Trade, an innovation by the nation's leading produce market reported to have been favored by the Food Administration, in order to enable cash interests to hedge their holdings and thus stabilize values.

Only four important restrictive provisions were adopted during the year. In April the Chicago Board of Trade adopted a rule prohibiting spreading in contracts of purchase or sale of April and May delivery in corn and oats, on the one side, and contracts in the same commodities for June and July delivery, on the other; and limiting the aggregate open interest for any individual, firm, or corporation, as regards the trading in corn and oats for delivery on and after June 1, to 200,000 bus. Later, in August, the Board limited speculative trading in rye futures to 100,000 bus., any one operator being prohibited from being long or short for more than that quantity at one time. In October the New York Cotton Exchange amended its ruling of 1917 (*A. Y. B.*, 1917, p. 322) designed to avoid abnormal fluctuations of the price caused by war conditions, by placing an immediate limit of 2 cents a pound on fluctuations in the price of future contracts in any one day, instead of the previous limit of three cents. On Nov. 13, however, the market underwent the full amount of the two-cent decline, largely, it is alleged, because of undue short-selling. As a consequence the Cotton Distribution Committee of the War Industries Board undertook the radical step of prohibiting speculative short selling in cotton on the New York and New Orleans Exchanges.

Stock Exchange Regulations.—Two new regulations of importance were adopted during the year by the New York Stock Exchange. The first, adopted in June, defines the nature of the contract that shall hereafter be made between New York Stock Exchange houses and correspondents who are not members of the Exchange but have telegraph or telephone connections with Exchange houses. As supplementary to the usual contract for wire or telephone connections between Exchange and non-member houses engaged in the brokerage business, the latter must now agree to report the following information in their reports to customers as regards stock-exchange transactions: the security bought or sold; the actual price paid for it, or received for it on the Exchange; the name of the New York Stock Exchange firm through whom the order was executed; the commission charged by said firm to the non-member; and the commission, if any, charged by him to the customer.

The second regulation, adopted in September at the request of the governor of the Federal Reserve Bank of New York and the chairman of the Liberty Loan Committee, requires the members of the New York Stock Exchange to furnish the Committee on Business Conduct with a daily statement of their total time and call borrowings. The request was made with a view to making it possible to exercise a reasonable and necessary control over the employment of credit as well as to avoid interference with the Government's financial operations.

Regulation of Stock Exchange Quotations. — Previous issues of the YEAR BOOK (1915, p. 344; 1916, p. 343) have called attention to the Massachusetts Public Service Commission's order to the Gold and Stock Telegraph Co., through its lessee, the Western Union Telegraph Co., to remove the alleged discrimination against Calvin H. Foster, Boston correspondent of a member of the New York Stock Exchange, whose request for a ticker service had been refused because the application had not been approved by the Stock Exchange, and the approval of the Commission's order in 1916 by the Massachusetts Supreme Court. Subsequently, the New York Stock Exchange, which has always taken the position that it has absolute control over its quotation service and should be allowed in the interest of the public's protection to retain such control, filed a petition in the U. S. District Court at Boston for an injunction restraining the Western Union from furnishing quotations to Foster, who was alleged to have the intention of using the quotations for bucket-shop purposes, on the ground "that the Massachusetts Public Service Commission's order is void inasmuch as the ticker service is interstate commerce over which the Commission has no control," and that the order violated the Federal Constitution.

Apparently, this matter has now been finally disposed of, since the U. S. Supreme Court, Justice Holmes handing down the decision, has found in favor of the Exchange. Although failing to discuss the bearing of the

Fourteenth Amendment, the Court upheld the contention of the Exchange that the ticker service was interstate commerce thus:

> It is enough that in our opinion the transmission of the quotations did not lose its character of inter-State commerce until it was completed in the brokers' offices and that the interference with it was of a kind not permitted to the States. The supposed analogy that has prevailed is that of a receiver of a package breaking bulk and selling at will in retail trade. But it appears to us misleading. We also think it unimportant that the contracts between the Exchange and the Telegraph Companies emphasize the element of quasi-sale for a lump sum and leave it to the interest of the Telegraph Companies to find subscribers. Neither that nor the intervention of an operator, or of another company, are in the least degree conclusive. Unlike the case of breaking bulk for subsequently determined retail sales, in those the ultimate recipients are determined before the message starts and have been accepted as the contemplated recipients by the Exchange. It does not matter if they have no contract with the Exchange, directly. It does not matter that if the Telegraph Companies did not deliver to any given one the Exchange could not complain. If the normal, contemplated and followed course is a transmission as continuous and rapid as science can make it from Exchange to broker's office it does not matter what are the stages or how little they are secured by covenant or bond. . . .
>
> If the transmission of the quotations is inter-State commerce, the order in question cannot be sustained. It is not like the requirement of some incidental convenience that can be afforded without seriously impeding the inter-State work. It is an attempt to affect in its very vitals the character of a business generically withdrawn from State control—to change the criteria by which customers are to be determined and so to change the business. It is suggested that the State gets the power from its power over the streets which it is necessary for the telegraph to cross. But if we assume that the plaintiffs in error under their present charters could be excluded from the streets, the consequence would not follow.

The War Finance Corporation.—An Act of April 5, 1918, created a War Finance Corporation composed of the Secretary of the Treasury and four additional persons appointed by the President, having succession for a period of ten years, provided that no powers shall be exercised by the Corporation, except as they may be incidental to the winding up of its affairs, after six months following the termination of the war. The capital stock of the Corporation is fixed at $500,000,000, all of which shall be subscribed by the United States. In brief the Corporation was empowered to do the following (see also XIV, *Banking and Currency*):

> (1) To make advances upon such terms as it may prescribe and for periods not to exceed five years to banks and trust companies which, since April 6, 1917, shall have made loans to or shall have purchased the bonds of any concerns whose operations are necessary or contributory to the prosecution of the war, but in no case shall the advance exceed 75 per cent. of the face of the loan or of the value of the bonds.
>
> (2) To make advances for periods not exceeding one year to any American savings bank, banking institution or trust company, or to any building and loan association, on the promissory note or notes of the borrowing institution, whenever the Corporation shall deem such advances to be necessary or contributory to the prosecution of the war, or to be in the public interest. Such notes, however, shall be secured by collateral equal to at least 133 per cent. of the amount advanced, and the rate of interest charged shall not be less than one per cent. in excess of the rate of discount for 90-day commercial paper prevailing at the time the advance is made.
>
> (3) To make advances directly to any person, firm, corporation, or association, conducting an established business in the United States, and whose operations are necessary to the prosecution of the war and which is unable to obtain funds upon reasonable terms through banking channels or from the general public. The advances are to be made for periods not exceeding five years, and in no case shall exceed at any one time an amount equal to 12½ per cent. of the authorized capital stock of the Corporation, plus the aggregate amount of bonds of the Corporation authorized to be outstanding at any one time when the capital stock is fully paid in. All advances must also be secured by adequate security.
>
> (4) To subscribe for, acquire and own, buy, sell and deal in bonds and obligations of the United States issued or converted after Sept. 24, 1917, to the extent that the Board of Directors, with the approval of the Secretary of the Treasury, may from time to time determine.
>
> (5) To issue its own bonds in an amount aggregating not more than six times its paid-in capital, such bonds to mature not less than one year or more than five years from the respective dates of issue, and to bear such rate or rates of interest and such redemption features as may be determined by the Board of Directors. The Secretary of the Treasury, however, must approve the rate of interest on such bonds, and they shall be a fixed charge on all the assets of the Corporation.
>
> (6) The Federal reserve banks shall be authorized, subject to regulations of the Federal Reserve Board, to discount

> the direct obligations of member banks secured by such bonds of the Corporation and to rediscount eligible paper secured by such bonds and endorsed by a member bank. No discount or rediscount under this section of the Act is to be granted at a less interest charge than one per cent. per annum above the prevailing rates for eligible commercial paper of corresponding maturity.

The Capital Issues Committee.—Part two of the same Act created a Capital Issues Committee composed of seven members, at least three of whom shall be members of the Federal Reserve Board. Among its various functions, the most important relates to its power

> to investigate, pass upon and determine whether it is compatible with the National interest that there should be sold or offered for sale or for subscription any issue, or any part of any issue, of securities hereafter issued by any person, firm, corporation, or association, the total or aggregate par or face value of which issue and any other securities issued by the same person, firm, corporation, or association since the passage of this Act is in excess of $100,000.

The Committee is not authorized, however, to pass upon any borrowings in the ordinary course of business as distinguished from borrowing for capital purposes; or the removal or refunding of existing indebtedness at the time of the passage of the Act; or the resale of securities determined by the Committee to be compatible with the national interest; or the issuance of securities by any railroad corporation under Government control; or bonds issued by the War Finance Corporation.

Anti-Trust and Other Leading Decisions.—Less of importance has occurred in court decisions than in previous years. On Jan. 2 Attorney-General Gregory requested the U. S. Supreme Court to defer argument on the seven important anti-trust suits then pending—those of the Government against the U. S. Steel Corporation, United Shoe Machinery Co., International Harvester Co., Eastman Kodak Co., American Can Co., Quaker Oats Co., and the Corn Products Refining Co.—until the next term of the court. The basis of the Government's motion was to the effect that

> in order that the Government in this time of stress may not meet with competition from private enterprises in its financial operations and the flotation of its loans, the Treasury Department has been constrained to urge that all private financing on a large scale shall be avoided as far as it is at all possible. It is quite clear that the dissolutions which are sought in the pending cases will require financial operations on a large scale if they are to be genuine and effective. Important as the remedy sought in these cases is believed to be, it must give place for the moment to the paramount needs of the hour.

The motion to continue all the cases except the first two was granted by the Court at once. The Steel Corporation, however, opposed the motion on the ground that delay would lengthen the state of uncertainty and would thus be unfair to the Corporation, its stockholders and employees; and the United Shoe Machinery Co. contended that the conduct of its business was greatly handicapped by the pending suit and that, even if dissolution were ordered, the refinancing of the Company would in no way interfere with the financial operations of the Government.

On May 20, by a decision of four to three, the U. S. Supreme Court decided against the Government's contention that the United Shoe Machinery Co. of Massachusetts is a combination in restraint of trade, and that its "tying" lease, by which it retains control over patented machinery, should be declared illegal. The Company owned various machines which it leased instead of sold, the lease containing an agreement that bound the lessee not to use other machines. Although the dissenting opinion holds that the Sherman Act "condemns all combinations and contracts the effect of which is to unduly restrain the free and natural flow of interstate commerce or monopolize or tend to monopolize trade or commerce in whole or in part," and regards the lease restrictions as having such a tendency, the majority opinion finds that the lease arrangement possessed certain distinct advantages. In the first place it enables small producers, otherwise unable to purchase them, to obtain the benefit of the machines; and secondly, patrons of the Company secure the benefits of all improvements and the resulting reduction in the cost of manufacture.

ECONOMICS

WESLEY C. MITCHELL

Economic Theory.—There are few fields of investigation from which a larger number of the active workers have been drawn into Government service since the United States entered the war than economics. Nevertheless the year has been notable for its contributions to economic theory. These contributions come mainly from a group of the younger men, who find much amiss in orthodox theory and who have a fairly definite plan for reconstructing the science. Their aim, in a word, is to make economics a social science of behavior.

Among the older men this group owes most to Thorstein Veblen and C. H. Cooley. Veblen's work they regard as "the weightiest contribution which has yet been made to the science of social psychology" (C. E. Ayers, *Jour. Philos. Psychol., and Sci. Method*, Jan., 1917). Cooley's sociological studies form an important part of the background of their constructive efforts. This year he has been encouraging the insurgents also by sweeping criticism of currently accepted economics. After reading certain treatises in high standing, he expressed surprise "that works so essentially static and individualistic . . . could be produced at the present day" (*Jour. Pol. Econ.*, April, 1917).

Perhaps the most systematic presentation of the position taken by the group in question is J. M. Clark's paper on "Economics and Modern Psychology," which sums up the inadequacies of the utility analysis and develops an outline for studying the guidance of "free" economic choices (*ibid.*, Jan. and Feb., 1918). W. H. Hamilton has discussed the place of value theory in economics and concluded that "the dominance of value theory just now seems to be becoming merely nominal, and the labors in semi-independent subjects seem to be passing from description to speculation and interpretation" (*ibid.*, March and April, 1918). The same writer illustrates the kind of problems that interest the group and the kind of solutions that seem to them significant by taking up the question: Why have the masses, endowed with political power by democracy, permitted the development of an economic system which has stripped them of ownership? His answer is an analysis of the indirect ways in which pecuniary institutions exercise constraint upon the behavior of different social groups (*ibid.*, Jan., 1918). Further evidence of the drift toward psychology in economics is afforded by Carlton Parker's discussion of instincts in economic life at the annual meeting of the American Economic Association; Irving Fisher's presidential address to the Association for Labor Legislation; W. R. Camp's inquiry as to why Ricardo's expectation that in the long run landlords would gain at the expense of capitalists has not been realized (*Pol. Sci. Quart.*, Sept. and Dec., 1917); and Ayers' survey of the functions and problems of economic theory, leading to the conclusion that fundamental changes are imminent—"the inauguration of a new cycle."

Business Cycles.—H. J. Davenport, in dealing with "the distributive relations of indirect goods," has criticised current theories concerning the relative price fluctuations of raw materials and finished goods.

Economic Problems of the War.—At its annual meeting in December, 1917, the American Economic Association devoted sessions to taxation, land policy, labor, price fixing, and tariffs. All these old themes have developed new phases under war conditions, and many economists have spent the year as officials in studying such matters from an administrative viewpoint. Most of the sessions of the Economic Association at the end of 1918 were again spent on such themes. The papers that have already appeared in the journals are but the advance guard of an army that will probably overrun the whole territory of applied economics in the next few years. One prevalent trait may be mentioned: most writers approve a policy of conscious social control through Government agencies. That practical bias is another indication that the preconceptions of economic theory are changing.

XIII. PUBLIC FINANCE, BANKING, AND INSURANCE

PUBLIC FINANCE

C. C. Williamson

FEDERAL FINANCE

Receipts and Expenditures.—The following table shows the ordinary receipts and expenditures of the Federal Government for the fiscal years ending June 30, 1917, and June 30, 1918, in millions of dollars:

	1917	1918
Ordinary Receipts		
Customs	$226	$180
Internal revenue:		
Ordinary	450	......
Corporation income tax	180	......
Individual income tax	180	......
Income and excess-profits tax	......	2,314
Miscellaneous	......	872
Miscellaneous	87	293
Total	1,123	3,659
Ordinary Disbursements		
Civil and Miscellaneous	265	1,524
War	410	5,665
Navy	257	1,369
Indians	31	31
Pensions	160	181
Postal deficiency	......	2
Interest on public debt	25	198
Total	1,148	8,970
Excess of ordinary disbursements over ordinary receipts	25	5,311
Balance in Treasury at close of year	1,067	1,585

The following statement shows the financial transactions of the Panama Canal to June 30, 1918:

Total amount expended or advanced to disbursing officers for purchase, construction, fortification, etc., to June 30, 1918	$439,809,601
Amount expended from proceeds of bonds, including premiums	138,600,869
Amount expended or advanced to disbursing officers out of ordinary receipts	267,348,000
Total Panama Canal bonds authorized by law	150,200,980
Total Panama Canal bonds issued to date	134,631,980

The following table shows the extraordinary disbursements and special revenues for the two fiscal years 1917 and 1918, in thousands of dollars:

	1917	1918
Extraordinary Disbursements		
Special		
Panama Canal	$19,783	$19
Virgin Islands	25,000	....
Subscription to stock of Federal land banks	8,880	....
Purchase of obligations of foreign Governments	885,000	4,738
Purchase of loan farm bonds	....	65
Total	$938,663	$4,822
Public Debt		
Bonds, interest-bearing notes and certificates retired	626,215	7,165,702
One-year Treasury notes redeemed	4,390	27,362
National bank notes and Federal reserve notes retired	40,574	21,625
Total	$671,179	$7,214,689
Grand total, extraordinary disbursements	$1,609,842	$7,219,511
Special Revenues		
Panama Canal tolls	6,151	6,036
Liberty Loan bonds	1,466,335	7,566,036
Certificates of indebtedness	918,205	8,790,732
Postal-savings bonds	1,795	1,021
War savings and thrift stamps	....	307,092
Deposits for purchase of one-year Treasury notes of April 1, 1916	4,390	19,150
Deposits for retirement of national bank notes	39,293	10,265
Total	$2,436,169	$16,700,332

Public Debt.—The following is a statement of the public debt of the United States as of June 30, 1918:

Interest-bearing debt:	
2s, Consols of 1930	$599,724,050
3s, Loan of 1908-1918	63,945,460
4s, Loan of 1925	118,489,900
2s, Panama Canal Loan, 1906	48,954,180
2s, Panama Canal Loan, 1908	25,947,400
3s, Panama Canal Loan, 1911	50,000,000
3s, Conversion Bonds, 1916	28,894,500
3s, One-Year Treasury Notes, 1916	19,150,000
2½s, Postal Savings bonds, 1911-17	10,758,560
2½s, Postal Savings bonds, 1918	302,140
Certificates of indebtedness (various rates)	1,706,204,500
First Liberty Loan (3½, 4 and 4¼ per cent.)	1,988,791,295
Second Liberty Loan (4 and 4¼ per cent.)	3,746,813,516
Third Liberty Loan (4¼ per cent.)	3,228,109,638
War savings and thrift stamps	349,797,297
Debt bearing no interest:	
United States Notes (greenbacks), less gold reserve	193,701,990
National bank notes (redemption account)	36,903,592
Old demand notes	53,013
Fractional currency	6,845,138
Debt on which interest has ceased:	
Funded loans of 1891	24,850
Loan of 1904	13,050
Funded loan of 1907	487,900
Refunding certificates	11,200
Old debt	900,550
Certificates of indebtedness, matured	18,805,000
Total interest bearing debt	11,985,882,436
Total debt on which interest has ceased	20,242,550
Total debt bearing no interest	237,503,733
Total interest and non-interest bearing debt, June 30, 1918	12,243,628,719
Balance in Treasury free of current obligations	1,319,347,364
Net debt, June 30,1918	$10,924,281,355

Expenditures.—When Congress adjourned in October, 1917, appropriations and contract authorizations for the fiscal year 1918 amounted to $21,390,730,940. In his annual report submitted to Congress on December 3, 1917, Secretary McAdoo estimated the actual disbursements at $18,775,919,955. It was apparently not generally realized that this was far in excess of the amount which could actually be spent, because the work planned could not be done. It was generally assumed that something like four-fifths of this would have to be raised by bond issues and other forms of borrowing. Towards the close of the third quarter of the year it became apparent, however, that cash disbursements would not much exceed $13,000,000,000. The Third Liberty Loan called for three billions instead of the six billions which had been anticipated, and the fiscal year closed with an actual cash expenditure of $13,795,287,290, of which approximately one-third had been raised by taxes and two-thirds by loans.

The rapid development of the war programme was reflected in the estimates for the fiscal year 1919. In December, 1917, the Secretary of the Treasury placed the amount at $12,804,034,440. Before the year was begun, however, the estimate had risen to $24,000,000,000. On the May, 1918, basis, expenditures for 1918-19 would have been over $18,000,000,000. Assuming, however, that the existing rate of increase would continue until December, 1918, and that for the remainder of the year requirements would remain stationary, Secretary McAdoo estimated that the requirements would aggregate $24,000,000,000.

Appropriations for the fiscal year 1919, including revised estimated permanent and indefinite appropriations, amounted to $27,054,117,070. The termination of the war makes possible so great reductions that no accurate estimate of expenditures for the year ending June 30, 1919, can be given. It is probable that for two or three years after the war, ordinary expenditures will amount to four or five billions. For many years it may be expected that expenditures will be nearer two billions annually than the one billion just before the war.

Loans to the Allies.—Under the authority granted to him by various acts of Congress, the Secretary of the Treasury has established credits in favor of foreign Governments as shown in the following table (to the end of November):

Great Britain	$3,945,000,000
France	2,445,000,000
Italy	1,210,000,000
Russia	325,000,000
Belgium	198,120,000
Greece	15,790,000
Cuba	15,000,000
Serbia	12,000,000
Roumania	6,666,666
Liberia	5,000,000
Czecho-Slovak Nat'l Council	7,000,000
Total	$8,184,576,666

Under existing laws, there is no authority to make further loans after the termination of the war. On Dec. 5 Secretary McAdoo requested Congress to continue the power to establish credits for the Allied Governments for a period of one year, to meet their requirements for reconstruction.

Treasury Certificates.—The method of interim financing by means of short-time Treasury certificates which formed a part of the original plan of financing the war (*A. Y. B.*, 1917, p. 330) was continued as a prominent feature of the financial programme. An initial offering of $400,000,000 four per cent. certificates was made on Jan. 22, with the idea of raising approximately $3,000,000,000 in this way by the middle of March and thus postponing the loan until conditions were more favorable for a wide distribution of the bonds. In connection with the second offering in February, Secretary McAdoo announced a plan of requesting banks to invest each week one per cent. of their total resources in certificates of indebtedness, which met with general approval and compliance. Offerings of $500,000,000 at intervals of about two weeks brought the total amount subscribed to $3,012,085,500 before the close of the Third Liberty Loan campaign. All but the first two of the six blocks bore 4½ per cent. interest.

On June 12 the Secretary of the Treasury announced a continuation of the plan adopted in February of offering Treasury certificates at short intervals and practically requiring banks to purchase them in amounts roughly proportioned to their resources. The first issue was dated June 25 and bore interest at 4½ per cent. Seven issues in all brought the total outstanding to $4,659,820,000, to be redeemed from the proceeds of the Fourth Liberty Loan, so that the net amount available from the loan was only a little more than $2,000,000,000. This amount being quickly exhausted, it was necessary to continue the use of Treasury certificates. The first offering in anticipation of the Fifth Liberty Loan was opened on Nov. 27.

Third Liberty Loan.—The Third Liberty Loan, deferred from February to April by means of Treasury certificates and reduced from the six billions at first anticipated to three billions, was offered for subscription on April 6, the selling compaign closing on May 4. The rate of 4½ per cent. on the Treasury certificates had raised some expectation that the bonds would bear the same rate. The rate was fixed at 4¼ per cent., however, the patriotic appeal being relied upon to absorb the issue. The result was a tremendous success. A total of 18,376,815 subscriptions amounted to $4,176,516,850, an over-subscription of 38.61 per cent. Bonds of the Third Loan are non-convertible and mature on Sept. 15, 1928, interest being payable semi-annually on Sept. 15 and March 15. Principal and interest are exempt from all Federal, state and local taxes, except Federal inheritance taxes, sur-taxes, excess-profits and war-profits taxes. Interest on a principal amount of $5,000 is tax-exempt except for Federal inheritance taxes.

Fourth Liberty Loan.—Amendments to the Liberty Bond bill, approved on July 9 and Sept. 24, authorized an increase of bonds from 12 billions to 20 billions and raised from 5½ billions to seven billions the authorized amount of loans to the Allies. The Fourth Liberty Loan offering was for $6,000,000,000 of 4¼ per cent. bonds, maturing on Oct. 15, 1938, and redeemable on and after Oct. 15, 1933, interest payable on April 15 and Oct. 15. The final figures showed subscriptions totalling $6,989,047,000, or 16.48 per cent. over-subscription, which makes it easily the largest and most important financial operation of the kind in the history of the world. The estimated number of subscribers was nearly twenty-two millions.

Liberty Bond Exemption Act.—Principal and interest of the Fourth Loan enjoy the same tax exemptions as the Second and Third Loans and in addition a special exemption provided in an act approved Sept. 24 "designed to stimulate the sale of Liberty bonds" by exempting the interest on $30,000 of these bonds in the hands of one holder from surtaxes, excess-profits and war-profits taxes until two years after the end of the war. A taxpayer who subscribed for $30,000 of these bonds and still holds them when he makes his income tax return is also entitled to a similar exemption upon the income from $45,000 of the Second and Third Loans. Holders of less than $30,000 of the Fourth Loan are entitled to exemption of earlier bonds in like proportion.

Liberty Bond Prices.—Principally on account of their complete tax exemption (except for inheritance taxes), the 3½ per cent. bonds of the First Liberty Loan have had a strong market, selling as high as 102½. Second 4s, however, although offered in comparatively small quantities, soon declined three or four points after trading began in them on Nov. 3, and actually sold as low as 93.86. This evidence that the normal demand for the bonds was already satisfied suggested the necessity of raising the rate on the bonds of the third loan or in some other way strengthening and stabilizing the market. The method adopted was an interesting experiment hitherto untried in Government financing. A so-called "sinking fund", more properly described as a "bond-purchase fund", was provided in the Third Liberty Bond Act (April 4, 1918), which authorized the Secretary of the Treasury to purchase a limited amount of bonds of the Second and Third Loans or the converted bonds of the First and Second Loans, at a price not to exceed par and accrued interest. To Oct. 31, 1918, bonds to a par value of $244,036,500, chiefly of the Second Loan, had been purchased.

Conversion of Liberty Bonds.—The 3½ per cent. bonds of the First Loan are convertible into any bonds issued at a higher rate during the war. The four per cent. bonds of the Second Loan and the four per cent. converted bonds of the first loan all bore the privilege of conversion into the 4¼ per cent. bonds. Under the regulations prescribed by the Secretary of the Treasury, the time limit for conversion expired on Nov. 9. Dates of maturity of principal and payment of interest and terms of redemption remain the same as in the original issue. The interest rate and other features of converted bonds follow the issue into which they are converted. The 4¼ per cent. bonds of the Fourth Loan are inconvertible.

War Savings Stamps.—War savings stamps were put on sale on Dec. 3, 1917, with the object not only of materially aiding in financing the war, but of promoting habits of thrift and economy among the people. The total amount authorized was $2,000,000,000. In spite of tremendous efforts, the sales of the war-savings certificates and thrift stamps amounted to only $96,298.403 on March 12. Secretary McAdoo's estimate of receipts from this source in the fiscal year ending June 30, 1918, was $663,200,000. The actual amount sold to that date was $349,797,297. Nevertheless, by the end of November the receipts amounted to nearly $900,000,000, showing that once a nation-wide sales organization had been created the results would fully meet expectations. About 150,000 war savings societies are registered at Washington, each with a membership of 10 persons to 12,000—about 31,000,000 persons pledged to economize and buy stamps. Besides the 550,000 post offices there were 232,000 other authorized selling agencies. The Liberty Bond Exemption Act of Sept. 24 authorized an increase in war savings stamps from two billions to four billions, and repealed the limitation of $1,000 on the amount that could be held by any one person at one time.

Fifth Liberty Loan.—The proceeds of the Fourth Loan had been anticipated and expended to such an extent by the seven offerings of Treasury certificates, which had brought in $4,659,820,000, that a fifth loan could not be avoided even after the armistice was signed shortly after the Fourth Loan was closed. Demobilization is at best a long and costly operation, and loans are still needed by the Allies. Secretary McAdoo announced on Nov. 19 that future offerings would probably consist of short-term bonds which will enjoy a threefold advantage. Since the public is well supplied with long-time holdings, a short-term issue will make a popular appeal; the Government will be in a position to take up and refund them at a lower rate of interest; and this will strengthen the position of the long-term bonds. It was also suggested that these short-term bonds would be sold continuously as long as the need lasted. At the end of November, however, it was conceded that a fifth intensive selling campaign would be necessary and would probably take place in April, 1919.

Treasury Tax Certificates.—Beginning Nov. 30, 1917, the Secretary of the Treasury offered Treasury certificates, as authorized by the act of Sept. 24, 1917, maturing June 25, bearing interest at four per cent., exempt from all taxes except inheritance taxes and surtaxes, and acceptable in payment of income and excess-profits taxes. The purpose of this and succeeding issues to the amount of $1,624,403,500, was to provide a medium that would avert a heavy strain on the banks and money markets of the country at the end of the year with the payment of some $2,000,000,000 in income and excess-profits taxes. Secretary McAdoo, announcing on March 2 that the rate on these tax certificates would not be increased to 4½ per cent. as on the certificates issued in anticipation of the Third Liberty Loan, said:

> The two issues are entirely different in character and purpose. The certificates issued in anticipation of the Third Liberty Loan are not acceptable in payment of income and excess-profits taxes, and, whatever their maturity, are subject to redemption at the option of the United States on and after the first instalment of the Second Liberty Loan, while the tax certificates are not subject to redemption and are not acceptable in payment of bond subscriptions.

On Aug. 16 an indefinite amount of certificates of the "tax series, 1919", dated Aug. 20 and payable July 15, 1919, was offered, but the sale was so unsatisfactory that a new series bearing 4½ per cent. interest was announced on Nov. 6.

One-Year Certificates of Indebtedness.—Still a third kind of Treasury certificates has been issued. These are one-year special certificates of indebtedness bearing two per cent. interest and sold to Federal reserve banks to secure the Federal reserve notes of $1 and $2 denominations (see also *Banking and Currency, infra*). These are the only two per cent. certificates sold since the United States entered the war. The amount issued was $61,217,000.

Revenue Legislation.—In his annual report for 1917 the Secretary of the Treasury expressed the hope that new revenue legislation would not be necessary until the country had time to adjust itself to existing laws. It became apparent as soon as Congress convened, however, that a partial revision at least of the War Revenue Act of Oct. 3, 1917 (*A. Y. B.*, 1917, p. 331) would be demanded. There was already a large body of opinion in favor of revising or eliminating certain sections of the law, such as the "salaries tax", the second-class mail section, and the sections involving cases of double taxation and special hardship. On Jan. 5 Senator Smoot offered a complete substitute for the existing War Revenue Act, making radical changes in the income and excess-profits tax, and repealing the zone system of second-class postage. Immediate revision of the law was not seriously considered by the responsible leaders until the increasing necessities of the Government began to indicate that additional taxes would have to be levied. In May Secretary McAdoo suggested that a bill providing a revenue of six billion dollars should be passed before the adjournment of Congress. Congressional leaders, partly for political reasons, wished to postpone legislation until December. They were also inclined to assume that the estimates of expenditure would once more prove to be exaggerated and that a way would be found to meet all requirements without new taxes. The Treasury Department insisted on speedy action so that the country might know as soon as possible what taxes would have to be paid on 1918 incomes. The President was reported on May 23 to be in agreement with the Congressional leaders. Secretary McAdoo's views prevailed, however, and on May 27 the necessity of revenue legislation at an early date was called to the attention of Congress by the President. Congress reluctantly abandoned the hope of early adjournment and the Ways and Means Committee set about framing a bill to raise by taxation $8,000,000,000, or twice the revenue produced by the existing law. In proposing to raise by taxation one-third of the estimated expenditures of $24,000,000,000 in 1918-19, the Treasury officials hoped to enforce economies in private expenditure without which it was felt that the financial operations of the Government could not be conducted.

A bill admittedly imperfect in detail but certain to raise the required revenue was reported by the Ways and Means Committee and passed unanimously by the House practically as reported on Sept. 23. On Sept. 24 the Senate Finance Committee began its revision of the bill, proceeding with the utmost deliberation from week to week, disregarding the importance of speedy action which was urged upon them by the Secretary of the Treasury. It is impossible to review in detail the work of the committee or the numerous proposals which engaged its attention. Strong efforts were made to reduce the taxes on business profits. No other nation engaged in the war, it was pointed out, was attempting to raise one-third of its expenditure by taxation. Our war expenses, moreover, include large loans to the Allies, which are really not to be counted in our expenses at all.

One feature of the revenue bill passed by the House that attracted much attention and vigorous protests was the taxation of income from municipal bonds and other obligations of states and subdivisions of states. This raised questions both of constitutionality and expediency. Apparently on the ground of unconstitutionality the Senate was expected to eliminate the provision.

The Finance Committee failed to finish its work before the election, and the bill was still unfinished when the sudden collapse of the Central Powers necessitated an immediate change of plans. On Nov. 12 the Committee reduced the $8,000,000,000 to $6,250,000,000, and on Nov. 14 Secretary McAdoo recommended still further reduction and the elimination of war and excess profits taxes after those paid on incomes of 1918, and revision of income-tax rates to yield $4,000,000,000 in 1920. The United States has always made provision for rapid retirement of war indebtedness, and it is expected that for this purpose large revenues will continue to be raised by income taxes.

By the end of November the Senate Finance Committee had completed its work on the bill, which codifies existing income and war taxes and makes many important changes and additions. The probability of delay in its passage and the possibility of further important changes preclude a review of its main features here. Republican opposition to the proposed maximum levy of $4,000,000,000 for 1920 seems likely to cause a delay that will make it necessary for the Treasury Department to proceed at once with plans for collecting the taxes on 1918 incomes under the old War Revenue Act. (See also I, *The Sixty-fifth Congress.*)

Subtreasuries.—An act of Congress approved on March 3, 1917, directed the Bureau of Efficiency to investigate the work performed by the subtreasuries to determine what part of their work can be performed by Federal reserve banks or other Government offices. The report submitted on Jan. 26, 1918, recommended the immediate suspension of subtreasuries in Baltimore, Philadelphia and Cincinnati, the immediate release of assistant treasurers in the six remaining subtreasuries, and the consolidation of the entire subtreasury system with the Federal reserve banks within six months after the end of the present war. So far no action has been taken. A bill adopting the recommendation was passed by the House but not accepted by the Senate.

Payment of Spanish-American War Bonds.—It is interesting to note that while the country was engaged in war financing of unprecedented magnitude, it was paying off the debt incurred in the last previous war. Loans for the Spanish-American war amounted to $198,792,660. Of this amount $63,945,460 still outstanding matured on Aug. 1 and was paid.

STATE AND LOCAL FINANCE

Legislative Tendencies.—The legislatures of 21 states have held regular or special sessions, or both, during the year, an unusual number of special sessions being required by emergencies growing out of war problems. Apparently in no case did a special session take up important problems of taxation and finance. And, for that matter, little tax legislation of especial importance was undertaken by the 11 legislatures which met in regular session. A few noteworthy acts are to be pointed out, but for the most part the enactments are concerned with removing defects that have appeared in recent statutes.

It is apparent that something which may be called a system of state and local taxation is gradually emerging from the chaos that has existed for several decades. One of the principal influences in bringing about some degree of uniformity and interstate comity has been the work of the National Tax Association. In 1918 the tendencies which have been manifest in the tax legislation of the more progressive states have been crystallized in a report of the Association's committee on a model tax law. This code, when it is later elaborated and discussed, is likely to have a very marked influence in promoting uniformity and efficiency in state tax systems.

Probably in no state has a more intelligent and drastic programme of financial legislation been put through than in New Jersey. Under the guidance of the Commission for the Survey of Municipal Financing of New Jersey, at least a dozen acts were passed as a part of a comprehensive plan which was aimed to bring the entire fiscal programme of municipalities and counties under uniform statutes without regard to their size or class, to improve budget procedure and debt administration, and to complete the system of state supervision and control of municipal and county finances. The Commission, which was originally created in 1916, has been continued for the third time (Joint Res. No. 2).

Property Taxes.—The New Jersey acts just referred to thoroughly revised and codified the general property tax law (Ch. 236) without materially changing its policy. The main purpose of a series of acts was to rearrange the dates for assessment, levy and collection of taxes so as to establish two collection periods and bring to hand local revenues at the time they are needed, as well as to bring in all collections before the close of the fiscal year.

In two states the matter of situs of personal property has been the subject of new legislation. The Massachusetts law was amended (Ch. 129) so as to tax all tangible personal property, except ships, where located, instead of at the residence of the owner. This change, it may be noted, follows the recommendations of the National Tax Association's committee on a model system of state and local taxation. In Texas a provision has been added (Ch. 40) to require moneys and securities deposited according to law with a state officer to be taxed in the county in which the owner resides or has a domicile. Domicile for purposes of taxing personal property was also defined in Virginia (Ch. 369).

Corporation Taxes.—Several amendments (Chs. 236, 239, 240 and 284) to the New Jersey laws taxing the property and franchises of railways, canals and other public-service corporations merely changed the date of filing returns and the date of assessment and payment of taxes to conform with the new system referred to above. By a new act (Ch. 148) additional taxes are imposed on the gross receipts upon which franchise taxes are already levied, of street railways, traction, gas, electric light, heat and power corporations, at the average rate of taxation in the state. This new tax is in lieu of all state, county, school and local taxation of personal property of the corporations.

Four separate acts (Chs. 271, 276, 292 and 417) were passed amending the New York tax on net income of manufacturing and mercantile corporations (*A. Y. B.*, 1917, p. 337). By a new definition of personal property an attempt is made to clear up doubt and controversy as to what machinery is to be classified as personal property and exempted from the local personal-property tax. A number of corporations, chiefly mercantile, not included originally, are brought under the provisions of the act. A minimum tax of $10 and not less than one mill on each dollar of capital stock employed in the state is provided in case the three per cent. tax on net income does not equal 0.1 per cent. of the capital stock. Another amendment gives the State Tax Commission authority to determine the taxable income instead of levying the tax on the return made for the Federal income tax without opportunity for correction of fraud or error.

A temporary emergency tax of one per cent. of the net income of foreign and domestic corporations, as reported for Federal income taxes, is levied in Massachusetts (Ch. 253 and 255). This tax, as provided in the acts, is operative for the current year only. The revenue is to be used for the general purposes of the commonwealth. Additional taxes were levied by the Virginia legislature (Ch. 409) on various kinds of public-service corporations in the year 1919 and thereafter. In most cases the tax is on gross receipts, though for certain corporations a mileage tax is added or substituted.

A number of minor changes in the corporation taxes were made by other Massachusetts acts. The excise tax of 0.01 per cent. of the par value of authorized capital stock in excess of $10,000,000 was repealed (Ch. 76). Machinery is added to the property of telephone and telegraph companies, the value of which is to be determined by the State Tax Commission (Ch. 138). The penalty for evading the tax on the stock of corporations was removed (Ch. 43). Stock without par value is to be considered as $100 par (Ch. 235).

In Maryland the bonus tax on corporations has been graduated (Ch. 466) and the rate fixed so as to reduce the tax on capitalization in excess of $1,000,000. The rate of the franchise tax on capital stock above $50,000 is also reduced. By the same act domestic corporations are exempted from the tax on their securities if they do no business within the state. Fertilizer companies are relieved of the gross receipts tax (Ch. 469) but must pay the graduated franchise tax on capital stock imposed on foreign corporations.

A Mississippi act (Ch. 466) imposes an additional bonus tax of $150 per million dollars of capital stock on authorized capital between $1,000,000 and $5,000,000 and $20 additional on each million thereafter. The tax was formerly 20 cents for each $1,000 of authorized capital stock. A Virginia act (Ch. 209) relieves domestic corporations which do no business in the state from income and *ad valorem* taxes (either state or local) on stocks, bonds, capital or other intangible property.

Bank Taxes.—Maryland has also amended the bank-tax law (Ch. 294) by including trust companies with banks whose stock is taxed at one per cent. in lieu of local taxes, except in Baltimore city. The one per cent. tax is to be paid at the place of residence of resident shareholders and where the bank is located for non-resident shareholders. A similar provision in regard to situs of shares of non-residents was made in Virginia (Ch. 356). A new bank-stock tax act in New Jersey (Ch. 265) replaces the act of 1914, the principal object being to make dates of assessment, collection, etc., conform with the new tax plan. A tax of 0.75 mill is levied on the capital, surplus and undivided profits of all banks (excluding savings banks) and trust companies. One-half of the revenue goes to the county and the other half to the taxing district in which the bank is located.

Income Taxes.—South Carolina repealed (No. 433) its income-tax law which imposed a graduated tax on incomes from property, professions, trades, employments and vocations. The Massachusetts law was amended (Ch. 32) by removing exemptions of income of married persons in cases where the joint income of both husband and wife exceeds $1,200. An exemption of $300 is to be allowed every person whose income does not exceed $600. The Virginia income-tax law was amended (Ch. 219) by defining more elaborately the income liable to taxation and deductions and exemptions allowed. Administrative provisions are also changed and local governments specifically prohibited from levying income taxes. An act passed by the Wisconsin legislature and vetoed by the governor would have levied, in addition to the existing income tax, graduated rates of 0.5 per cent. to 1.5 per cent. on incomes over $15,000. It was expected to yield about $1,400,000. The Massachusetts income-tax law was amended (Ch. 257, Sec. 62-74) to give the Tax

Commission authority to require employers to report not only the names and addresses of employees paid a compensation of $1,800 or more, but also the exact amount. Other amendments remedy minor defects in the law. An additional tax (Ch. 252) for one year only is levied in Massachusetts on all incomes taxed at present at a rate equal to 10 per cent. of existing taxes. An income-tax law passed by the lower house of the Mississippi legislature was defeated in the Senate.

Inheritance Taxes.—A special joint commission of Mississippi (see *infra*) recommended an inheritance-tax law, and the legislature passed an act (Ch. 109) providing an estate tax and a graduated inheritance tax on both direct and collateral heirs. The estate of every decedent, resident or non-resident, must pay a tax of 0.5 per cent. when the value exceeds $5,000. On transfers of any kind of property by will, or in contemplation of death without adequate consideration, a graduated tax is levied. The rate for direct heirs runs from 0.5 per cent. on amounts from $4,500 or $7,500 to $25,000, to three per cent. on amounts in excess of $500,000. Other heirs must pay from five per cent. on amounts of $500 to $25,000 to eight per cent. on amounts in excess of $1,000,000.

Virginia has had a flat-rate tax on collateral heirs. The law was amended in 1918 (Ch. 238) to cover direct heirs as well, and rates were graduated. For direct heirs the rates run from one per cent. to 10 and for collateral from five per cent. to 15. Administrative provisions of the law were thoroughly revised. Massachusetts made a horizontal increase of 25 per cent. in her taxes on legacies and successions (Ch. 191) for one year after the date of the act (May 3, 1918). Another amendment (Ch. 14) allows a discount of four per cent. per annum on inheritance taxes paid before they are due. Amendments of minor interest were made in New York (Ch. 111), New Jersey (Ch. 283), South Dakota (Ch. 27), and Arizona (Ch. 2).

Tax Commissions.—An unsuccessful attempt was made to abolish the Mississippi Tax Commission created in 1916, which had become a storm center. The Commission was not only retained, but its powers extended (Ch. 138) by placing in its hands the assessment of railroads and other public-service corporations. By other acts (Chs. 135, 228) its duties were altered in less important particulars. The entire tax situation in Mississippi was thoroughly studied by a special recess committee ordered by both branches of the legislature in 1916 to report to the 1918 legislature. The two bodies, acting as a joint committee, upheld the Tax Commission, pointing out its duties and responsibilities and recommending a course of action for it. Recommendations of the special committees included a constitutional amendment to effect the abolition of the general property tax and the substitution of a classified property tax, an income tax, an inheritance tax, a gross-earnings tax for public-service corporations, and central control over local taxation and finance.

Important changes have been made in the administrative machinery of Kentucky. An appointive member of the Tax Commission has been substituted (Ch. 29) for the auditor of public accounts *ex officio*, and the authority of the Commission greatly extended by the abolition of the assessor's office (Ch. 11) and the creation of county tax commissioners who work under its supervision, protected by a merit system. The authority of the Commission also extends to the county boards of supervisors who revise the work of the county commissioners. The State Commission may now order reassessments or set aside assessments and make new ones.

Budget Procedure.—The necessity for budget reform has long been recognized in Massachusetts. Definite steps taken in 1910 led to the appointment in 1917 of a joint recess committee (*A. Y. B.*, 1917, p. 340) which submitted to the legislature in January a report recommending the adoption of a budget system instead of the time-honored procedure of making appropriations. The committee, as it had been empowered to do, had already submitted a preliminary budget (House Doc. 17) for the fiscal year 1918, the first budget plan ever submitted in the history of the state.

The bill recommended by the committee and enacted with but slight modifications establishes an executive budget system. On or before the 15th day of October every board, department, or institution must submit to the supervisor of administration detailed statements, of which duplicates are to be sent to the state auditor, showing current appropriations and estimates for the ensuing year and giving explanations of increases asked, together with such other information as may be required. The auditor is required to compile these estimates and comparative data and file them, together with an estimate of revenues, with the supervisor of administration, whose duty it is to study the estimates and, after making investigations, prepare a budget containing the recommendations of the governor.

Not later than the second Wednesday of January of each year, the governor is to submit to the legislature a budget showing separately the estimates and his recommendations for the expenses of administration, operation and maintenance; deficiencies or overdrafts in appropriations of former years; new construction, additions, improvements and other capital outlays; the requirements of the debt service; and all requests and proposals for expenditures for new projects. The governor is also required to make definite recommendations as to the financing of the expenditures recommended. All appropriations based upon the budget and to be paid from taxes must be incorporated in a single general appropriation bill. Supplementary messages relating to appropriations may be submitted throughout the session.

In addition to the excellent budget law enacted by the legislature the Constitutional Convention recommended a constitutional provision which was adopted at the general election in November. This amendment provides an executive budget substantially in accord with the statute recommended by the budget commission and enacted by the legislature. The principal object attained by the constitutional amendment was to give the governor the power to veto items or parts of items in appropriation bills. The amendment also incorporated the provision included in the bill recommended by the committee, but rejected by the legislature, prohibiting the enactment of any special appropriation bill, except on recommendation of the governor, until after final action on the general appropriation bill. Such special bills must provide the specific means for defraying the appropriation.

Virginia and Mississippi have taken their places this year in the rapidly growing list of states having a modern executive budget system. The Virginia act (Ch. 64) requires the usual estimates before Nov. 1. By the same date the state auditor must furnish the governor various financial data, while the departments and institutions are also subject to his call for information. The governor must hold public hearings during November and make a "careful survey" of all departments, institutions, etc. Within five days of the regular session of the legislature the governor must submit a printed budget to the presiding officer of each house and an appropriation bill to put the budget into effect. Into his budget and appropriation bill the governor has to put the estimates of the legislature and the judiciary as submitted by them, but all other items are to be "based on his own conclusions and judgment". When considering the governor's appropriation bill the standing committees must sit jointly in open session and require the attendance of responsible representatives of spending departments. The legislature may increase or decrease items, but may enact no special appropriation bill until the budget bill has been acted upon. This latter provision, which is found in many budget systems, is designed to check the flow of local and political appropriation bills until after the important financial needs of the state have been met.

Under the Mississippi act (Ch. 225), forty days before the convening of the legislature, the spending departments and institutions are required to submit detailed estimates and a specified minimum amount of information. The governor revises the estimates at his discretion and must mail to each member of the legislature a printed copy of his budget, which is to include an official financial statement by the auditor. Beyond requiring the governor to present the budget to the legislature on the first day of the session, the law is silent as to procedure.

Kentucky has made a beginning in reform of budget procedure by establishing (Ch. 12) an *ex officio* budget appropriation commission composed of the governor and the state auditor. Estimates must be filed on standard forms before Jan. 1. A statement of financial conditions comes from the treasurer. On Jan. 5 the commission meets. After examination and investigation, in the course of which it may hold hearings, the commission prepares a budget and a message, with two appropriation bills embodying its recommendations to the legislature. Procedure after bills are submitted is not specified. (See also V, *State Administration.*)

Local Finance.—The so-called "pay-as-you-go" plan of financing in New York City, which permitted the issue of bonds only for revenue producing improvements, has been modified by an "act for the relief of the city . . . in financing its obligations during the period of the war and one year thereafter. . . ." (Ch. 658). This act authorizes the city to issue bonds without regard to existing debt limits to an amount not exceeding $15,000,000 for each calendar year until one year after the termination of the war. The resolution or ordinance authorizing the bonds must state the minimum estimated period of usefulness of the improvement and the bonds must mature within that period, which may vary from 10 to 50 years. Bonds for purposes not expressly authorized by the law may not run longer than 10 years and no bonds may be issued under the act for acquiring a public utility.

Constitutional Amendments.—Constitutional amendments having to do with taxation and finance were under consideration by legislatures or voted upon at the November election in several states. A full record will be found elsewhere (see V, *Amendments to State Constitutions*).

BANKING AND CURRENCY

Ray B. Westerfield

The Currency.—Several very striking changes occurred between Oct. 1, 1917, and Oct. 1, 1918, in the currency of the country.

(1) While the total gold stock (coin and bullion) has increased but 34 millions, the amount held in the Treasury has increased 81 millions, and the amount in the Federal reserve banks and with Federal reserve

STATEMENT OF THE CURRENCY, 1917-18

Forms of Currency	General Stock of Money in the United States (millions)		Held in the Treasury as Assets of the Government (millions)		Held by F. R. Banks and Agents against F. R. Notes (millions)		Money in Circulation (millions)	
	Oct. 1, 1917	Oct. 1, 1918	Oct. 1, 1917	Oct. 1, 1918	Oct. 1, 1917	Oct. 1, 1918	Oct. 1, 1917	Oct. 1, 1918
Gold coin (including bullion in Treasury)	$3,035.4	$3,079.0	$196.3	$277.6	$4.1	$901.2	$693.5	$962.7
Gold certificates	....	....	....	....	528.1	197.4	1,613.0	740.0
Standard silver dollars	568.2	374.0	15.3	28.7	....	....	73.9	12.7
Silver certificates	....	....	....	....	....	....	477.0	330.7
Subsidiary silver	204.0	232.4	1.9	5.9	....	....	202.0	226.4
Treasury notes of 1890	....	....	....	....	....	....	1.9	1.8
United States notes	346.6	346.7	5.7	8.2	....	....	340.8	338.4
Federal reserve notes	711.9	2,525.4	5.1	38.3	....	122.0	706.8	2,365.0
Federal reserve bank notes	12.4	42.7	0.0	0.2	....	....	12.3	42.5
National bank notes	716.6	721.4	17.7	20.9	....	....	698.8	700.9
Total currency	$5,595.3	$7,322.4	$242.4	$380.2	$532.3	$1,220.7	$4,820.5	5,721.04
Per capita circulation	....	....	....	....	....	....	$46.10	$53.82

agents has increased from 4.1 to 901.2 millions; on the other hand, the gold certificates held by the Federal reserve banks and Federal reserve agents has fallen from 528.1 to 197.4 millions, and those in circulation from 1,613.0 to 740.0 millions. In other words, there has occurred a most marked concentration of gold in the Federal reserve system, 873 millions of gold certificates have disappeared from circulation, and the reserve banks and agents tend to carry gold rather than gold certificates.

(2) These gold operations have been accompanied by an expansion of the Federal reserve notes in circulation from 706.8 to 2,365.0 millions, and the Federal reserve banks and agents also have on hand 122.0 extra. This is an unprecedented expansion in any form of currency, but it is fundamentally a substitution of Federal reserve notes for gold certificates (see *infra*).

(3) The volume of national-bank notes has remained practically constant. The process of reduction provided by the Federal Reserve Act has been stopped by the flotation of the Liberty Loan bonds bearing higher rates of interest than the old 2's or the conversion 3's. This defeated the market for the 2's. The War Savings plan has had a similar effect.

(4) A considerable increase in our subsidiary currency has been necessitated by rising prices, more active business, and particularly the new price quotations in odd cents or other amounts requiring small coins.

(5) The standard silver dollars, having stood at about 568 millions since the last were coined in 1905, were reduced to 374.0 millions, and the silver certificates by which they are circulated were reduced by an amount nearly as large. This operation was due to the Pittman Act of April 13, 1918, which, in order to increase the stock of silver available for export to meet the very heavy demands of Europe and the Far East (*A. Y. B.*, 1917, p. 341), authorized the Secretary of the Treasury to reduce silver dollars, in number not to exceed $250,000,000, to bullion, and to sell it at a minimum price of $1 per fine ounce; at the same time he was authorized to enter into contracts with producers to buy silver at the maximum price of $1 per fine ounce, the purchases being to restore the bullion taken from the Treasury and sold to exporters to India, China and Japan. The Treasury, through the Federal reserve banks, is collecting silver certificates and cancelling them, thus freeing the silver dollars. To take the place of the cancelled certifi-

RESOURCES AND LIABILITIES OF NATIONAL MEMBER BANKS, 1917-18

	Sept. 2, 1917 (millions)	Aug. 31, 1918 (millions)	Per cent. Change
RESOURCES:			
Loans and discounts	$9,055	$9,507	+ 5.0
United States bonds and securities	1,159	2,455	+11.2
Other bonds and securities	1,863	1,794	− 3.7
Due from Federal reserve banks	1,046	1,307	+25.0
Net amount due from National banks	1,296	1,196	− 7.8
Net amount due from other banks, bankers and trust companies	341	331	− 2.9
Cash	493	364	−26.2
Customers' liability under letters of credit	29	15	−48.3
Customers' liability under acceptances	133	231	+73.7
Other assets	1,432	843	−41.1
Total	$16,543	$18,043	+ 9.0
LIABILITIES:			
Capital, surplus and undivided profits	$2,213	$2,282	+ 3.1
National banknotes outstanding	665	674	+ 1.4
Due to banks and bankers	3,048	2,885	− 5.0
Individual deposits	9,976	10,492	+ 4.1
Letters of credit	36	24	−33.3
Acceptances based on exports and imports	138	243	+76.1
Other liabilities	467	1,443	+209.0
Total	$16,543	$18,043	+ 9.0
Liabilities for rediscounts	169	603	+259.0

cates until other silver is produced and purchased, the Federal reserve banks are authorized to issue $1 and $2 Federal reserve bank notes secured by Treasury certificates of indebtedness and one-year Treasury notes. These bank notes, which are subject to tax, will be retired later as new silver certificates are issued against silver purchased by the Treasury. In executing the law the Treasury fixed a price of $1.01½ per fine ounce at which it sells silver for export, and no silver bought anywhere for more than that price is allowed to be exported; this action practically fixed a world price for the metal.

(6) The total money in circulation increased from $4,820.5 millions to $5,721.4 millions, or 18 per cent., and the *per capita* circulation from $46.10 to $53.82.

The National Banking System.—The war has scarcely abated the rapid expansion of the national banking system characterizing the period since 1914 (see *A. Y. B.*, 1917, page 342). The changes that have occurred during the year are shown in the accompanying table of resources and liabilities of all the national member banks combined, on the dates of the calls of the Comptroller of the currency.

Geographical distribution of the national banks and their resources is shown in the following table:

Section	Number of Banks			Resources (millions)			Capital, Surplus and Undivided Profits (millions)		
	Sept. 11, 1917	Aug. 31, 1918	Change	Sept. 11, 1917	Aug. 31, 1918	Per cent Change	Sept. 11, 1917	Aug. 31, 1918	Per cent Change
New England....	403	406	+ 3	$1,186	$1,276	+ 7.7	$207	$213	+ 2.9
Eastern states....	1,644	1,644	0	6,858	7,397	+ 7.8	847	873	+ 3.0
Southern states...	1,583	1,592	+ 9	1,891	2,180	+15.4	323	333	+ 3.1
Middle states....	2,114	2,131	+17	4,230	4,635	+ 9.3	545	557	+ 2.2
Western states...	1,349	1,392	+43	1,182	1,265	+ 7.0	133	139	+ 4.5
Pacific states.....	541	558	+17	1,187	1,279	+ 7.7	155	157	+ 1.3
Island possessions	4	5	+1	6	8	+33.3	1	1	0
Total.......	7,638	7,728	+90	$16,543	$18,043	+ 9.0	$2,211	$2,273	+ 2.8

State Banks in the Federal Reserve System.—As a result of the campaign inaugurated in 1917 (*A. Y. B.*, 1917, p. 343) and the pressure of war conditions, state banks and trust companies joined the Federal reserve system in large numbers in the last quarter of 1917 and in 1918. Those joining include many of the strongest institutions in the United States. On June 21, 1917, there were 53 state bank and trust-company members, but by Dec. 31 the number had increased to 250; the aggregate capital and surplus of state bank members had increased from 78 millions to 525 millions, and aggregate resources from 825 millions to 4,744 millions. By Sept. 1, 1918, the state member institutions had increased to 713, having total capital and surplus of 700 millions and total resources of $6,609 millions. The system has come to include nearly the whole of the commercial banking capital of the United States. During August, 1918, alone, 125 state institutions joined.

Bank Acceptances.—It is important to note the acceptance liabilities of banks in the United States for it reveals the growth of a relatively new phase of banking for them. The acceptance liabilities of national banks in principal cities on June 29 were:

	Millions		*Millions*
New York......	$96.5	Atlanta........	$ 0.7
Boston.........	45.5	New Orleans....	0.8
Philadelphia....	18.3	Charleston......	1.4
Pittsburgh......	3.4	Chicago.........	18.8
Cleveland......	5.2	Minneapolis....	1.6
Cincinnati......	0.6	St. Louis.......	1.7
Richmond......	3.0	Dallas..........	1.9
Baltimore......	2.3	SanFrancisco....	9.4
All others...............			19.9
Total..................			$231.8

Available data regarding acceptance liabilities of other institutions are:

	Millions
All national banks..................	$231.8
Trust companies in Greater New York (June 20).......................	114.1
State banks in Greater New York (June 20).......................	8.3
Trust companies in Boston (June 29)	19.9
Trust companies in Baltimore (June 29)	1.1
State banks and trust companies in St. Louis (June 29)...............	7.0

Trust Powers of National Banks.—Section 11K of the Federal Reserve Act, which was a subject of litigation between state trust companies and national banks in 1916 and 1917 (*A. Y. B.*, 1917, p. 343) continued to be a subject of discussion in 1918. The Trust Company section of the American Bankers' Association, as well as other interested parties, felt that trust funds of national banks should be segregated from their commercial funds and the two businesses handled separately, as is required by law in most states; otherwise, instead of Section 11K simply putting national banks on the same competitive basis with state banks and trust companies, the advantage would be with the national banks. On Sept. 26, 1918, was enacted the so-called Phelan Act, which amends Section 11K of the Federal Reserve Act to provide that a national bank exercising fiduciary powers must segregate all assets held in any fiduciary capacity from its general assets and keep a separate set of books and records for these transactions, which books and records must be open to inspection by the state authorities to the same extent as the books and records of those operating under state law; that no national bank may receive in its trust department deposits of current funds, subject to check or the deposit of checks, drafts, bills of exchange or other items for collection or exchange purposes; and that funds deposited or held in trust by the bank awaiting investment must be carried in a separate account and not be used by the bank in the conduct of its business unless it first set aside in the trust department United States bonds or other securities approved by the Federal Reserve Board. The law has other provisions which are intended to put national and state banks on the same competitive basis and hedge them about with quite the same safeguards.

Bank Reserves.—Section 19 of the Federal Reserve Act, as amended Aug. 15, 1914, and June 21, 1917, has been further amended, to the effect that if a member bank in a reserve city, as now or hereafter defined, is located in the outlying parts of that city or in territory added to that city by extension of its corporate charter, it may, upon the affirmative vote of five members of the Federal Reserve Board, hold the same reserves as a country bank; and likewise that a member bank similarly situated in a central reserve city may, upon the affirmative vote of five members of the Federal Reserve Board, keep the same reserves as a country bank or reserve city bank.

The reserves of national banks and their distribution on Aug. 31, 1918, are presented in the following table:

	Held		Required		Excess (millions)
	Millions	Per cent.	Millions	Per cent.	
By banks in central reserve cities..	$456	14.82	$400	13.0	$56
By banks in reserve cities.........	323	10.84	298	10.0	25
By country banks................	333	7.59	307	7.0	26
Total........................	$1,113	....	$1,005	....	$107

Deposits and Clearings.—The deposits in national banks have fluctuated as follows, according to the calls of the Comptroller of the Currency: Dec. 31, 1917, 10,734 millions; March 4, 1918, 10,454; May 10, 10,436; June 29, 10,181; Aug. 31, 10,492. The Clearing House Section of the American Bankers Association has developed a plan under which it reports not only the total clearings for the 29 cities now compiling and reporting these figures to the Section, but also the total transactions, which represent all debits against accounts, covering individual, bank, general, and savings deposits. A statement of these figures will hereafter be given to the press quarterly, and will constitute an excellent business barometer. The figures already published show, for the second quarter: total clearings, 9,833 millions, and total transactions, 22,897 millions; and for the third quarter, 10,386 millions and 24,612 millions, respectively. The total clearings at the New York Clearing House for the year ending Sept. 30, 1918, were 191,779 millions, comparing with 193,681 millions for year ending Sept. 30, 1917, 155,742 millions for the year ending Sept. 30, 1916, and 96,183 millions for the year ending Sept. 30, 1915 (see also XII, *Economic Conditions*). Due to war-finance operations the volume of transactions has been very erratic. The payments of loans and taxes have occasioned large deposits of public moneys from time to time. To facilitate the war-finance operations the Federal Reserve Board arranged for weekly reports from the banks in the 100 largest cities, the totals of which are published contemporaneously with the reports of condition of the Federal reserve banks. The Board has also undertaken the publication in the *Federal Reserve Bulletin* of a series of indices of business conditions compiled from available sources, and presenting data as nearly definite and authoritative as they can be made with reference to the progress of business, changes in economic conditions, and general alteration in the financial and banking situation.

During the year considerable agitation has arisen over the payment of interest by reserve-city banks on bank balances. The bidding for accounts by the banks and trust companies became very marked in New York, Chicago and other cities, the commercial banks feeling themselves obliged to meet the higher rates paid by the trust companies and the trust companies justifying their bids on the grounds that their deposits were more largely for long terms. There was also very active bidding as between cities, the interior cities trying to capture balances carried normally in the East. The large local demands for credit, at good interest rates, and the possibility of investing idle funds in Treasury certificates of indebtedness at 4½ per cent., likewise inclined the banks to reduce their balances to a minimum unless the reserve-city banks paid more liberal interest. The clearing houses and Federal reserve banks deplored this competition, for it tended to raise the general money rates and make war financing more difficult. The general result has been that the clearing houses in the chief reserve cities have each adopted a schedule of maximum rates of interest varying with the discount rates at the Federal reserve bank, and fixing severe penalties for violation of these sliding rates. (See also XII, *Economic Conditions.*)

Another controversy was caused by the proposal by the Comptroller of the Currency of a bill, introduced by Senator Owen on Feb. 18, providing for the guaranty by the Government of individual deposits not exceeding $5,000. The money with which to reimburse depositors of insolvent national banks was to be advanced by the Treasury and recouped by a levy against all national banks of 0.1 per cent. on the aggregate of all deposits of $5,000 or less and a similar levy on all other deposits after deducting from each deposit the amount by which they exceed $5,000. As a result of protests by the Federal Reserve Board, clearing houses, and banking associations throughout the country, the bill died in Committee.

Exchange and Collections.—Among the many events relating to domestic exchange and collections the following may be briefly mentioned:

(1) The limit for which Federal reserve exchange and transfer drafts (*A. Y. B.*, 1917, p. 348) may be drawn was raised from $250 to $5,000 beginning Sept. 3.

(2) On Aug. 12 the Federal Reserve Board recommended to the Federal reserve banks that they give immediate credit for clearing-house items on the day such items are received from other Federal reserve banks, without regard to the time of day received, the balances so credited to be included in the credit balances reported for settlement through the Gold Settlement Fund clearings. This is done in order to bring about a daily settlement of clearing-house items. In practice the balance created by receipt of checks is reported to the Gold Settlement Fund at the close of business but is really settled the following day when the checks have been collected.

(3) The New York Clearing House announced on July 29 that hereafter it will permit bankers' acceptances and notes made payable at clearing

banks to be cleared through the exchanges on the day of maturity, so that final payment may be made on the due date. This supplants the custom of presenting such items at maturity and receiving either certification thereof or checks, final payment thus being delayed for one day after maturity. This will reduce the so-called one-day "float". In accordance with this action the leading banks of New York, Boston, Philadelphia, Chicago and other cities have adopted a uniform rule covering the time and manner of reimbursement from clients for such acceptances.

(4) On July 1 a system of daily clearings through the Gold Settlement Fund was instituted. Heretofore clearings had been made weekly. At the close of business each night each Federal reserve bank wires the Federal Reserve Board the aggregate amounts credited that day to each other Federal reserve bank, and the Board makes debits and credits accordingly and wires each bank its net debit or credit.

(5) The increasing volume of business cleared through the Gold Settlement Fund is evident from the following data of the total clearings and transfers by years since 1915:

1915	$1,052,000,000
1916	5,533,000,000
1917	27,154,000,000
1918 to Aug. 22	29,311,000,000
Total	$63,053,000,000

The net changes in the ownership of gold for the whole period of the Fund amount to 0.94 per cent. of the total obligations settled during that period.

(6) The great growth of the Federal reserve clearing system appears from the following average transactions on the dates indicated:

	Number		Amount	
	July 16, 1917	Aug. 15, 1918	July 16, 1917	Aug. 15, 1918
Items drawn on banks in Federal reserve city	36,727	50,229	$98,075,919	$172,600,132
Items drawn on banks in district outside Federal reserve city	175,625	406,330	40,353,278	131,047,263
Items drawn on banks in other districts	31,273	76,404	37,981,022	58,502,291
Items handled by both parent bank and branches	....	13,395	....	11,254,817
Total (exclusive of items drawn on Treasury of United States)	243,625	546,358	176,410,219	373,404,503
Items drawn on Treasury of United States	19,533	81,523	9,701,569	41,063,646
Number of member banks	7,683	8,294	....	....
Number of non-member banks on par list	8,837	10,206	....	....

The Federal Reserve Bank of New York has stated that the banks on the par list handle over 95 per cent. of the volume of checks in circulation and a still larger percentage of the volume which member banks in its district are called upon to collect.

(7) The Federal reserve banks have arranged to make telegraphic transfers of funds of member banks to banks in other districts absolutely at par, no charge being made even for the cost of the telegram. To accomplish this a system of private telegraph lines between all the reserve banks and their branches as well as with the Federal Reserve Board in Washington has been put into operation.

(8) At the recommendation of the Federal reserve banks and with the approval of the Federal Reserve Board, the service charges on out-of-town checks were suspended, and the cost of collection is now absorbed by the Federal reserve banks. The reserve banks stand ready to receive from member banks for collection, without any charge whatever, checks drawn on banking institutions in the United States which can be handled at par. The suspension of collection charges will remove one of the principal causes of indirect routing of checks.

(9) The Attorney-General considered the question whether the limitations laid by the Hardwich amend-

ment (*A. Y. B.*, 1917, p. 351) apply to non-member state banks which do not become depositors with a Federal reserve bank so as to avail themselves of the Federal reserve clearing system, but checks upon which may pass through the Federal reserve banks in process of clearing or collection. He held that the intent of the Federal Reserve Act was not to subject state banks against their will to Federal control or regulation and that the Hardwich amendment did not limit the non-member state banks. If these banks insist upon making charges against the Federal reserve banks, the result will simply be, so far as the Federal Reserve Act is concerned, that since the Federal reserve banks cannot pay these charges, they cannot clear or collect checks on banks demanding such payment from them. This decision is important, for it prevents the establishment of a universal system except as the state banks by voluntary action join the Federal system.

The Federal Reserve Banks.—A consolidated statement of the 12 Federal reserve banks in mid-October, 1917 and 1918, appears opposite.

	Oct. 19, 1917 (millions)	Oct. 18, 1918 (millions)
Resources:		
Gold coin and certificates in vault	$419.0	$382.0
Gold settlement fund	369.0	416.0
Gold with foreign agencies	52.0	5.0
Total gold held by banks	$841.0	$804.0
Gold with Federal reserve agents	618.0	1,173.0
Gold redemption fund	11.0	57.0
Total gold reserves	$1,471.0	$2,035.0
Legal tender notes, silver etc.	48.0	52.0
Total reserves	$1,520.0	$2,087.0
Bills discounted for members	286.0	[1]1,687.0
Bills bought in open market	171.0	370.0
Total bills on hand	$458.0	$2,058.0
U. S. Government long-term securities	55.0	28.0
U. S. Government short-term securities	47.0	67.0
Municipal warrants	0.2	0.2
Total earning assets	560.0	2,154.0
Due from other Federal reserve banks, net	32.0	....
Uncollected items	332.0	803.0
Total deductions from gross deposits	$364.0	....
Five per cent. redemption fund against Federal reserve bank notes	0.5	3.0
All other resources	1.0	13.0
Total resources	$2,447.0	$5,063.0
Liabilities:		
Capital paid in	61.0	79.0
Surplus	....	1.0
Government deposits	76.0	179.0
Due to members, reserve account	1,230.0	1,506.0
Other deposits including foreign government credits	43.0	112.0
Collection items	210.0	505.0
Total gross deposits	1,559.0	2,384.0
Federal reserve notes in actual circulation	815.0	2,502.0
Federal reserve bank notes in circulation, net liability	8.0	55.0
All other liabilities	2.0	40.0
Total liabilities	$2,447.0	$5,063.0
Ratio of total reserves to net deposit and Federal reserve note liabilities combined	75.6%	51.1%
Ratio of gold reserves to Federal reserve notes in actual circulation, after setting aside 35% against net deposit liabilities	61.3%	....

The distribution of some of the leading items in the statement for Oct. 10 as among the Federal reserve banks is shown in the table on the next page.

These tables reveal a stupendous development of the Federal reserve system during the year. The total resources a little more than doubled; the earning assets quadrupled; the deposits increased by a half, and the Federal reserve notes trebled. One of the most striking things is the change of character of the earning assets of the reserve banks. Whereas in 1917 $102,000,000 out of $560,000,000 consisted of Government securities, in 1918 they constituted only $95,000,000 out of $2,154,000,000; in their stead there has been an expansion of $1,600,000,000 in bills on hand. Of this $1,600,000,000, however, $1,262,000,000 were secured by Government war obligations and do not represent commercial paper and commercial banking, but rather the great service of these banks in war financing. Many member banks, in order to facilitate subscriptions to the Liberty

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[1] Bills discounted: secured by Government war obligations, 1,262 millions; all other, 425 millions.

CONDITION OF THE FEDERAL RESERVE BANKS, OCT. 10, 1918

(In Millions of Dollars)

	Boston	New York	Philadelphia	Cleveland	Richmond	Atlanta	Chicago	St. Louis	Minneapolis	Kansas City	Dallas	San Francisco	Total
Total gold reserve	128	649	178	217	90	68	300	60	79	78	38	142	2,031
Bills discounted secured by government war obligations	{ 75	589	90	55	49	47	193	52	22	32	30	64	1,304
	{ 11	106	18	28	17	29	59	28	34	48	26	40	450
Bills bought in open market	53	118	24	53	5	8	37	4	1	1	1	27	338
U. S. long-term securities	0	1	1	1	1	0	4	1	0	8	4	3	28
U. S. short-term securities	2	29	4	11	1	2	7	3	1	1	1	1	66
Total earning assets	143	845	139	150	75	88	301	89	59	93	64	137	2,187
Total resources	330	1,705	400	424	218	194	684	226	158	228	125	313	5,011
Capital paid in	6	20	7	8	4	3	11	3	3	3	3	4	78
Government deposits	28	42	24	27	7	10	14	14	9	19	7	25	230
Due to members—reserve account	91	641	97	108	48	38	214	50	47	61	34	74	1,508
Total gross deposits	164	924	177	172	95	77	282	112	68	111	55	119	2,361
Federal reserve notes in actual circulation	155	727	211	237	116	111	375	107	84	103	62	185	2,478
Federal reserve bank notes in circulation (net)	1	18	2	3	0	1	9	1	0	8	3	2	52

Loans, have loaned freely to their customers at a rate equal to, or a bare fraction higher than, the bond rate, with a 10 per cent. margin or less, and have depended upon the Federal reserve bank's special discount rate for 90-day paper secured by Liberty bonds. Assets of this type, in the last analysis, differ little from outright investments by these banks in the Liberty bonds; they represent a temporary eclipse of commercial banking by securities, operations, but their high sense of patriotic devotion strongly inclines the givers of these notes to lift them at maturity and not let the pledged collateral go to sale.

The great increase in the volume of earning assets has had a marked effect on the earnings. The total earnings for the first six months of 1918 were $24,850,190 for all the banks combined; the earnings in excess of current expenses, $20,698,162; the percentage of net earnings to calculated average paid-in capital (annual rate), 55.9 per cent. (the New York reserve bank made 96.9 per cent.); and the dividends declared, $3,186,446. Six of the banks have accumulated a surplus of $1,134,000, and payments of a like sum have been made (for the first time on Dec. 31) to the Treasury as a franchise tax. Their high earnings may help to explain their readiness to absorb the service charges (see *supra*) for collections. They have also stifled all complaint by member banks against subscriptions to capital of the Federal reserve banks. Additional net expenditure in bank premises during the same period amounted to $1,194,263.

The second very noteworthy fact among these items is the expansion of the Federal reserve notes from 815.0 to 2,502.0 millions. This has occasioned much discussion of inflation, but an analysis of the currency reveals a very important change in its composition, a substitution of the Federal reserve note for the gold certificate (see also "The Currency," *supra*). The normal increase in the need for currency, based on the growth of population; the increased activity of industry; the very considerable amounts of currency carried on their persons by the non-banking but prosperous laboring class; the withdrawals of United States currencies to Mexico, Canada and Cuba; the larger need for currency during crop-moving months—these and other factors have tended to deflate the net expansion of the Federal reserve notes. The greatest factor of inflation is undoubtedly the increase in deposit currency of the national and state banks.

The item of Federal reserve bank notes has finally become noteworthy;

its increase is, as explained above, due to the provisions of the Pittman Act (see "The Currency," *supra*).

The Discount Market.—The discount market and operations have been vitally affected by several events.

(1) The stamp tax on bills of exchange and promissory notes (*A. Y. B.*, 1917, p. 332) had the effect of practically killing the use of the one- to 15-day loan method by which member banks rehabilitated their impaired reserves with the Federal reserve banks. The tax of two cents per $100 amounted, particularly on very short-term loans, to a severe restraint on borrowing thus on promissory notes. There was devised the method of selling Treasury certificates of indebtedness (or other securities) with agreement or option of repurchase within 15 days. This obviated the drawing of a note and the payment of the tax. The tax, so far as it pertains to advances by reserve banks to member banks, was removed by a provision in the War Finance Corporation Act in February. Statistics indicate that a large part of the advances by the reserve banks to member banks are now on bills secured by Government securities.

(2) There have been launched, in New York and Boston, several discount houses, after the London type, which will deal in commercial bills and acceptances. These houses are formed and owned by groups of leading bankers and financiers, and promise to become important institutions in our financial system.

(3) On Aug. 23 a leading New York banking house announced that it would lend money on call to those who were able to present eligible acceptances as collateral, at rates varying with the discount rate of the reserve bank. This promotes the establishment of an acceptance market after the European model, where the call-loan rate on acceptances has been as distinctive as our call-loan rate on stock-exchange collateral. Other institutions undoubtedly will follow suit and a higher degree of marketability will attach to acceptances.

(4) On Oct. 1 the Federal Reserve Bank of New York announced the creation of special, preferential rediscount rates for bankers' acceptances as distinguished from other forms of eligible commercial paper. This recognizes the higher security attaching to bankers' acceptances with the endorsement of a member bank than to other paper bearing a similar endorsement. The establishment of this rate will make banks more ready to endorse acceptances purchased by them from brokers and rediscount them at the reserve bank, and to make investments in bankers' acceptances and thus broaden the market for the paper.

Foreign Exchange and Gold Movements.—The net balance of imported gold for the year 1917 was nearly 182 millions; in 1918 up to Sept. 10 the balance of imports fell to just short of 22 millions (see also XII, *Economic Conditions*). These data show that the flow of gold has been practically stopped. The immense gold importations which characterized 1916-17 have ceased; and although the balance of general trade continues in our favor (see XIX, *External Commerce*), foreign exchange is controlled by loans to the Allies and other expedients. Effective measures have been taken to stop all exportation of gold except as specifically permitted by the Federal Reserve Board acting through its Division of Foreign Exchange (*A. Y. B.*, 1917, p. 349). The policy of permitting gold exports now turns on whether the merchandise is desirable from the standpoint of national interest, and whether, if so, it can or cannot be paid for by some other means than the shipping of gold, whereas until June the matter turned on whether a given shipment of gold could be definitely connected with a specified shipment of goods.

With sterling exchange pegged, arbitrage transactions through New York or unfavorable balances of trade with respect to certain countries have turned certain exchange rates decidedly against America and have occasioned considerable discussion of the advisability and methods of correcting the rates. The rupee exchange situation was handled by the Pittman Act (see "The Currency," *supra*). Lire and peseta and Spanish-American exchanges have been largely adjusted by loans. One proposed rem-

RESOURCES AND LIABILITIES OF INSTITUTIONS UNDER STATE CHARTERS, JUNE 29, 1918

(In Millions of Dollars)

	State Banks	Mutual Savings Banks	Stock Savings Banks	Loan and Trust Companies	Private Banks	Total Banks
Number reporting	16,596 *(millions)*	625 *(millions)*	1,194 *(millions)*	1,669 *(millions)*	1,091 *(millions)*	21,175 *(millions)*
RESOURCES:						
Loans and discounts (including overdrafts)	$4,773	$2,314	$787	$4,403	$146	$12,426
Investments (bonds, securities, etc.)	1,258	2,173	209	2,115	26	5,784
Banking houses (including furniture and fixtures)	177	41	30	167	8	425
Other real estate owned	46	24	7	41	6	125
Due from banks	1,032	202	106	980	37	2,360
Checks and other cash items (including exchanges for clearing house)	146	1	3	116	1	268
Cash on hand	278	24	32	171	6	513
All other resources	102	36	3	321	2	465
Total resources	$7,815	$4,818	$1,183	$8,317	$236	$22,371
LIABILITIES:						
Capital stock paid in	640	.....	68	525	18	1,253
Surplus fund	322	315	34	543	9	1,225
Undivided profits	104	58	12	103	3	283
Due to banks	278	0	2	509	1	792
Dividends unpaid	4	.....	0	5	0	10
Individual deposits	6,114	4,422	1,049	5,970	193	17,750
Postal savings deposits	6	0	0	7	0	14
Notes and bills rediscounted	65	0	0	99	0	165
Bills payable	159	1	7	166	4	340
Other liabilities	120	20	5	386	3	535
Total liabilities	$7,815	$4,818	$1,183	$8,317	$236	$22,371

edy was strongly urged upon Congress by Senator Owen and others, namely, the establishment of a "Foreign Exchange Bank" associated with or paralleling the Federal reserve system. After extended hearings before Congressional committees and canvassing of exporters, importers, bankers, and others, the bill failed, but the proposal is still being urged.

The rapid rise in Government and bank credits the world over has occasioned apprehension lest the existing gold fund prove insufficient to support the credit superstructure. At the same time the rising costs of gold mining have tended to the abandonment of marginal mines (see also XVII, *Gold and Silver*) and created an agitation on the part of gold producers and others interested for Government subsidies to gold production. Another movement is for the conversion of old gold articles into bullion. The Mint has issued a circular advising the public of its readiness to purchase all such articles on the basis of their gold content, and several places for such sales are being provided.

State, Savings, and Private Banks, Loan and Trust Companies.—There reported to the Comptroller of the Currency on June 29, 1918, 21,175 institutions under state charters, with aggregate resources of 22,371 millions. This is an increase in number of 856, and in aggregate resources of 1,535 millions, during the fiscal year. The table above presents the main items in their financial statements.

Among the events not noted elsewhere especially appertaining to state institutions may be mentioned the following: (1) The passage of acts by state legislatures permitting savings banks to buy acceptances, thus widening the discount market and making their assets more liquid. (2) The announcement on July 23 by the War Finance Corporation of its willingness to make advances, under Section 7 of the creating Act (see XII, *The Conduct of Business*), to banks and trust companies, members as well as non-members, which have made loans to farmers and cattlemen; the loans are limited to 75 per cent. of the amount of loans made by the borrowing bank, or to 100 per cent. in case the borrowing institution itself furnishes additional collateral to the extent of 33 per cent. of the advance. (3) The establishment of a United States Council of State Banking Associations, effected at a meeting of state banking Associations at St. Louis on July 15 (see constitution in the *Federal Reserve Bulletin*, Aug., 1918). Its creation was due to the tendency towards "federalization" of banking and it is intended to defend the state institutions against undue aggression or harm in this regard.

The Banks and War Finance.—The many ways in which the banks aided the First and Second Liberty Loans as described in the YEAR BOOK for 1917 (p. 349) have been continued and developed still further. The capacity of the Federal reserve system for handling these loans and tax payments and consequent shifts in the amounts, character and purposes of the credits has proven equal to all demands. The system was largely relieved by the creation of the War Finance Corporation to handle financial credits, and, in case of need, to make advances to banks and loan associations during crop-moving or other periods of stress. It has also been aided by the so-called Money Committee in New York, composed of representatives of the leading Wall Street banks, who have devised a scheme of controlling the money rates by pooling their loan fund, refusing time loans, conserving credits, etc. (see also XII, *Economic Conditions*). The banks have facilitated the war savings stamps campaign by constant advertising and by acting as agents at selling them. Numerous banks have effected special arrangements in France whereby the soldiers and others enjoy extraordinary banking accommodations. (See also XIII, *Public Finance.*)

Federal Legislation.—In addition to the banking legislation noted in the foregoing sections, few strictly banking acts have been enacted by Congress. The most noteworthy measure of the year is the so-called Phelan Act of Sept. 26, 1918, which dealt with a variety of subjects. The Federal Reserve Board is given discretion in the grouping of member banks in each district for the selection of Class A and Class B directors of the reserve banks so as to give a fair representation to both large and small member banks; the manner of election is detailed in the Act. The Act also authorizes the issuance of Federal reserve notes in denominations of $500, $1,000, $5,000, and $10,000; the largest Federal reserve note heretofore authorized by law was $100. The larger denominations become necessary as Federal reserve notes displace the large gold certificates in circulation (see "The Currency," *supra*). In amending Section 22 of the Federal Reserve Act the new law clarifies the language which stipulated that no officer, director, employee or attorney of any member bank shall be a beneficiary or receive directly or indirectly any fee, commission, gift or other consideration for or in connection with any transaction or business of a bank. The Act also extends penal provisions for embezzlement and other offenses against banks to officers, directors, agents or employees of Federal reserve banks. Most of these amendments were at the instance of the Federal Reserve Board and Comptroller of the Currency.

Several other acts affect or are of interest to banks, though not strictly banking legislation:

(1) The Act of April 5, 1918, creating the War Finance Corporation with authorized capital of $500,000,000, empowered to issue bonds aggregating not more than six times its paid-in capital, to make loans to needy corporations and industries on the basis of pledged securities, etc. (see also XII, *Economic Conditions*).

(2) The Webb Act of April 10, to promote export trade by permitting the organization of exporters in associations to meet foreign competition, under supervision of the Federal Trade Commission, without violating the antitrust laws (see also XII, *Economic Conditions*).

(3) The Soldiers' and Sailors' Relief Act of March 8, providing a temporary suspension of legal proceedings and transactions which may prejudice the civil rights of soldiers and sailors during their term of service in the war.

(4) The Liberty Loan Acts (see also *Public Finance, supra*). The first two contained provisions authorizing the Secretary of the Treasury to deposit with designated banks and trust companies any portion of the proceeds of sale of bonds, certificates of indebtedness, and

war savings stamps; the third added permission to deposit in such designated depositaries money received from payments of income and excess-profits taxes; the fourth contains the provision that any bank or trust company designated as a depositary which gives security for deposits may, upon terms prescribed by the Secretary of the Treasury, act as fiscal agent of the United States in connection with the operations of selling and delivering bonds, certificates of indebtedness or war-savings certificates of the United States. A supplement to the second act provides a limited exemption from income taxes and war and excess profits taxes upon income to be derived from the Fourth Liberty Loan bonds, and frees a larger portion of the income from the first, second and third loan issues from similar taxation. It also amends Section 5200, U. S. Revised Statutes, so as to permit any national bank to lend a borrower, in addition to one-tenth of capital and surplus, an additional amount not to exceed 10 per cent. of capital and surplus in case the borrower discounts with such bank a note or notes secured by not less than a like amount of U. S. bonds issued since April 24, 1917, or certificates of indebtedness.

State Legislation.—Only a few states had regular sessions of their legislatures during the year, it being the off year. The amount of legislation has consequently been rather scant. In New York an important act passed is one providing an adequate punishment for the issuing of bad checks (Ch. 314, Laws of 1918); it allows the maker to escape punishment if he makes the amount of the check good within ten days after notice of non-payment and pays the interest and protest fees. The American Bankers Association adopted recommendations urging the passage of a uniform statute to prevent fraud in the transfer of accounts receivable by secret transfers, and of the necessary legislation in many states to enable state banks without loss or disadvantage to enter the Federal reserve system. (See also XIII, *Public Finance.*)

The Postal Savings System.—In the Post Office Appropriation Act, approved July 2, 1918, the limit on the amount that a postal-savings depositor may have to his credit at interest was increased from $1,000 (as it was under the amendment of May 18, 1916) to $2,500. Non-interest-bearing deposits cannot be accepted. Postal savings have been adversely affected by the war savings stamps, which have the same security, that is, the credit of the United States, and bear much higher interest from date of purchase. During the fiscal year 1918 the changes were as follows:

	June 30, 1917	Dec. 30, 1917	June 30, 1918
Total depositories in operation	7,161	6,756	6,678
Balance to credit of depositors	$131,000,000	$143,192,649	$148,471,499
Number of depositors	674,728	659,136	612,188
Average principal per depositor	$195.57	$217.24	$242.53
Balance on deposit in banks	$126,000,000	$138,640,669	$140,658,608

The issues of Postal Savings Bonds during the year were:

Issue	Dated	Registered	Coupon	Total
14th	January 1, 1918	$275,280	$26,860	$302,140
15th	July 1, 1918	176,500	21,680	198,180
Total issues to July 1, 1918		$9,892,240	$1,366,640	$11,258,880

The ten leading states in amounts of deposits on June 30, 1918, were as follows, in millions: New York, 47.7; Pennsylvania, 17.6; Illinois, 10.1; Ohio, 9.9; Michigan, 6.4; Massachusetts, 6.4; New Jersey, 6.0; Washington, 4.7; Connecticut, 4.5; California, 4.3.

The ten cities having the highest deposits on June 30, 1918, were as follows:

	June 30, 1917 (millions)	June 30, 1918 (millions)
New York	$29.7	$32.1
Brooklyn	9.5	10.3
Chicago	6.9	6.8
Detroit	4.2	4.5
Boston	3.0	3.2
Pittsburgh	2.7	2.8
Cleveland	1.8	2.1
Philadelphia	1.7	2.0
Newark, N. J.	1.3	1.6
Portland	1.6	1.6

The number of banking institutions qualified as depositories for postal-savings funds changed as follows:

	June 30, 1917	June 30, 1918
National banks	3,486	3,359
State banks	1,274	1,223
Savings banks	242	225
Trust companies	568	598
Organized private banks	13	12
Total	5,583	5,417

The Federal Farm Loan System.—Rural credit has been subjected to sudden and unusual strains in 1918; the farmer has experienced a big increase in his need for capital in the face of a limited market. The Federal farm-loan system has proven very useful in this crisis but not all sufficing. South Dakota has supplemented existing rural credits by several issues of "rural-credit bonds" (Acts of 1917, Ch. 333). The War Finance Corporation arranged, on July 23, to extend loans through the Federal Reserve banks and their members to worthy needy farming interests; on Aug. 13, to make direct loans to individuals, firms and corporations whose principal business is the raising of live stock, including cattle, sheep, goats, and hogs (special cattle-loan companies were instituted to execute these loans); and on Aug. 17, to make loans to canners of fruits and vegetables on the basis of products warehoused with a warehouse company created for the purpose. The Secretary of the Treasury, coöperating with the Secretary of Agriculture, established on July 27 a fund of $5,000,000 with the Federal Land banks, as financial agents of the Government, to make and collect loans to help needy farmers make goodly plantings in districts hard hit by drought and winter-killing in the Northwest and Southwest. (See also XVI, *Agriculture.*)

The organization of national farm-loan associations has proceeded rapidly; by June 27, there were 3,106. Their number will not grow as rapidly in the future, for there is now one for practically every county in the country and experience is teaching the wisdom of consolidated associations for reasons financial and social and for the saving of time and labor. The distribution of farm-loan associations and loans by districts on that date was as follows:

Federal Land Bank of	Farm-Loan Associations	Loans	
		No.	Amount (thousands)
Springfield	92	1,613	$4,391
Baltimore	123	1,756	4,299
Columbia	286	2,853	5,318
Louisville	253	3,052	7,386
New Orleans	280	6,751	8,350
St. Louis	285	4,117	7,810
St. Paul	354	7,583	16,884
Omaha	251	3,355	13,922
Wichita	398	6,499	12,911
Houston	260	4,129	10,583
Berkeley	145	2,375	7,182
Spokane	379	7,761	18,206

Up to Aug. 1, covering the first 15 months of the operation of the system, over 51,000 farmers had obtained loans, averaging $2,200 and aggregating $117,249,000. There had been received 98,628 applications for loans, aggregating $242,724,000, and of these 83,282, for loans of $173,550,000, had been approved.

The system sustained much hostile criticism in the latter part of 1917, and the Farm Loan Board was forced to answer charges that the system was not self-supporting and was being financed out of capital, by showing that at its inception it had only capital funds, and that with the small initial volume of business, the cost of operation was unavoidably high. This altercation was occasioned by the inability of the Board to sell its 4½ per cent. bonds at 101⅛. One reason for the slow sale was doubt as to the constitutionality of the bonds, now affirmed by the Attorney-General, and as to the success of the system; besides, the bonds were a new investment not well advertised and their virtues were not known, few states had made them a legal investment for trust funds, they had to compete with the Liberty bonds, etc. Applications for loans far exceeded the supply of funds, and the system needed help at once if it was to perform its expected function and get well established. Congress came to its aid with a bill enacted on Jan. 18, authorizing the Secretary of the Treasury to buy at par and accrued interest, with any funds in the Treasury not otherwise appropriated, from any Federal land bank, farm-loan bonds not exceeding $100,000,000 during each of the fiscal years ending June 30, 1918 and 1919; these bonds are to be held in the Treasury and are redeemable at the respective Federal land banks one year after the close of the war. This legislation created a market for the bonds at par. The rate of interest on the new bonds issued was also raised to five per cent. (and the interest on the basal mortgages to 5½ per cent.) and the selling price lowered to 100½. An offering of Federal farm-loan bonds, bearing 5 per cent. interest, dated May 1, 1918, and due May 1, 1938, was made in May by a syndicate of New York bankers at 101 and interest, netting 4.75 per cent. to the redeemable date (1923) and five per cent. thereafter up to redemption at maturity. The first $15,000,000 was oversubscribed. During two weeks $60,000,000 were sold before withdrawal of the offerings on June 5 to make way for the Liberty Loan. The farm-loan bonds have risen in value because of their tax-exemption feature; by the latter part of August they were selling at 106. More states have made them legal investment for public and trust funds.

The aid of the Federal Farm Loan Board in securing an amendment to the Federal Farm Loan Act to pave the way for the reorganization of private farm-mortgage banks as adjuncts of the Federal system was sought by representatives of the Farm Mortgage Bankers' Association in Washington on Nov. 2, 1917. The Board announced accordingly, on Dec. 23, that it would recommend in its annual report (1) to remove the present restriction permitting a joint-stock land bank to do business in the state where it is situated and but one contiguous state; (2) to permit a bank to issue bonds to the amount of 20 times its capital stock, which must be $250,000 or more, instead of 15 times, as under existing laws; and (3) to raise from six to 6½ per cent. the maximum interest rate which joint-stock land banks may charge on loans to farmers. There now exist a number of joint-stock land banks operating under the Federal system; they are located at Chicago, Charleston, W. Va., Indianapolis, Salina, Kans., and Memphis. Several issues of their farm-loan bonds have been made, bearing five per cent. interest and tax-exempt. Their exemption from taxes has put them in a favored class and the bonds are selling above par.

LIFE INSURANCE

WENDELL M. STRONG

General.—The year 1916 was one of unexampled growth of life insurance, but 1917 surpassed it. The increase over 1916 in each of the important items of growth shown in the table below, was greater than in the previous year. Like the previous year, the conditions under which the business was obtained were, in general, satisfactory, and the wastage in surrenders and lapses was not high. The increase in policy loans also was small, likewise a healthful sign.

No statistics for the year 1918 will be available for some months, but in a general way the tendencies of the year are known. The slowing down of new business, noted towards the end of 1917 (*A. Y. B.*, 1917, p. 352), extended well into the year 1918. While the latter part of the year has shown a marked recovery, the year as a whole will not show much increase, possibly none at all, over 1917. In view, however, of the high record set by the preceding year and the millions of men in military and naval service, who thereby became eligible for the Government insurance (*A. Y. B.*, 1917, p. 354) and hence were, for the time being, lost as possible customers of the companies, the results seem favorable, and the conditions under which the business was obtained have been good.

The year marked the completion of the mutualization of a great stock company, the Equitable Life Insurance Society. This step of the Equitable has a peculiar interest in view of the history of the company. Not quite as old as the Mutual Life and

STATISTICS OF UNITED STATES LIFE-INSURANCE COMPANIES

(*Insurance Year Book*)

YEAR	Number of Companies	END OF YEAR		Premiums Received[2] (millions)	Total Income[2] (millions)	Total Payments to Policyholders[2] (millions)	Total Disbursements[2] (millions)	New Business[3] (millions)	Amount in Force at End of Year[3] (millions)
		Admitted Assets[2] (millions)	Surplus[1] (millions)						
1917	228	$5,915	$748	$928	$1,248	$590	$845	$3,982	$22,024
1916	232	5,550	702	846	1,124	555	790	3,274	19,854
1915	235	5,190	663	784	1,042	544	767	2,643	18,351
1914	250	4,940	665	748	988	510	708	2,507	17,381
1913	259	4,658	624	715	925	468	659	2,533	16,588
1912	248	4,407	621	672	893	447	628	2,405	15,559

[1] Includes amounts set apart for dividends to policyholders during following year. [2] Includes industrial business in 26 companies. [3] Does not include industrial business.

the New York Life, it quickly after its founding obtained important rank and at one time had the largest amount of insurance in force of all. For the many years that these three were the greatest life-insurance companies of the world, the Equitable was the representative of the stock plan as against the mutual plan of the Mutual Life and the New York Life. Closely associated with its foundation and early years are the modifications of the tontine system which played so important a part, particularly in the deferred-dividend form, in life insurance in this country prior to 1907. The passing of the Equitable, following by several years that of the Metropolitan, into the mutual ranks would seem to mean that the stock-company plan of life insurance will henceforth be of less relative importance than formerly.

Financially the year 1918 was unlike any that preceded it. The investments of the companies have been nearly altogether in Liberty bonds. This has meant a great aid to the Government in floating its loans, the total that the companies subscribed from their funds to the various loans of 1917 and 1918 being more than half a billion dollars. The result, however, for the companies, viewed from the financial standpoint alone, can hardly be considered favorable, since they have invested funds in bonds bringing 4¼ per cent. interest or less (the first loan was only 3½ per cent.) at a time when bond prices were low and the opportunities for investments in high-grade bonds realizing a much higher rate of interest were unexampled. Taken in the broader view, however, it is doubtful if many of the policy holders, for the sake of dividends a trifle larger, would have wished the companies to do other than they did—put practically every dollar into Liberty bonds.

SURRENDERS, LAPSES, LOANS, AND DIVIDENDS[1]

(*New York State Report*)

YEAR	Number of Companies	Amount in Force, End of Year (millions)	Amount of Policies Surrendered (millions)	Amount of Policies Lapsed (millions)	Policy Loans End of Year (millions)	Dividends to Policyholders (millions)	Amount Paid for Surrendered Policies (millions)
1917	34	$18,422	$284	$397	$711	$130	$93
1916	35	16,784	341	384	693	119	100
1915	35	15,632	390	433	691	106	113
1914	35	14,933	362	427	657	104	102
1913	34	14,304	339	383	614	96	87
1912	34	13,527	276	366	548	88	84

[1] Life companies reporting to State of New York only.

The effect on life insurance of the price inflation that has taken place is peculiar. Since the contract is paid for in dollars and is settled by the payment of dollars, this effect is not direct. Indirectly there is the increase in expense from higher salaries for employees and higher cost of supplies, not an important item considering the total sums handled, so long as the commissions remain the same, which they do. A much greater indirect effect has been that the policy which a few years ago would have been sufficient in amount to have protected the family in case of the insured's death, no longer suffices, and its amount must be increased. This has undoubtedly had something to do with the rapid increase in amount of new business of the last few years. It has also resulted in the average policy written increasing in size.

Taxation.—Federal taxes on life insurance are a development of the last few years only and are part of the Federal taxes on corporations in general. They are not, as yet, of very large amount, but are an added load to the burden of state taxes and fees. One of the most unfortunate things about the Federal taxation has been that the statutes were not clear, and in consequence differences of interpretation between the Collector of Internal Revenue and the companies have arisen. In particular the excess-profits tax has been difficult to deal with, since the statute apparently was drawn without thought that such corporations as the mutual life-insurance companies could exist where there was no capital in the ordinary sense. How the law will finally be applied to these is still a matter of doubt. In the attempt to avoid difficulties of a similar nature for future years, the Treasury Department, with the coöperation of life-insurance experts, has proposed for the pending revenue bill (see *Public Finance, supra*) a basis of taxation which would make the amount of tax payable a definite thing instead of a subject of controversy. The suggestion offered has been accepted by the Senate Committee and seems in a fair way to be incorporated in the bill in its final form. If this is done the total amount payable will probably be but slightly changed, but the expense and vexation of controversies and law suits will be avoided.

The burden that life insurance bears in taxation is probably not generally realized. The New York State report shows that one company paid in 1917, exclusive of taxes on real estate, over two million dollars and four others between one and two millions each, for taxes, licenses and fees, all of which may properly be called taxes. In one of these cases, these payments were more than the salaries and all other compensation of officers, directors, trustees and home-office employees; in another, more than two-thirds of such salaries and compensation. When it is considered that insurance is the most unselfish kind of thrift, and is at the same time the most important to the public interest, since its essential feature is the providing for the helpless members of the family when the wage earner is taken away, so that they will not become public charges, there seems small justification for taxation on such a scale. It is the insured who pays this tax through his insurance costing more than it otherwise would.

Death Losses: War and Influenza.—The losses from death due directly to the war have been surprisingly small. This is true not only for those companies whose business has been entirely or almost entirely in the United States, and which consequently would lose little, if any, except from deaths among the United States forces, but also for those companies having a large European business, which, consequently, have suffered losses from the deaths of those in European armies from the beginning of the war in 1914. The reason for the comparatively small losses under insurance of those in the United States Army is not far to seek; it is largely from the combination of two causes: the total number of deaths among the American forces in the fighting was small in comparison with the total number of our forces, and most of those engaged in the actual fighting were regulars or drawn from the class of young and unmarried men, a class which carries little insurance.

Of far more serious import in the mortality experience of the companies (and of the nation as well) has been the Spanish influenza, by far the most serious epidemic this country has ever known (see XXV, *Medicine*, and *Public Health*). The deaths from this might properly be counted as indirectly war losses if the belief held by many that the influenza is an indirect result of the war should be verified. It was not until about October first that the influenza became of noticeable importance in the death claims received by the companies. In the months of October and November the total claims received by various companies were increased, presumably almost altogether by this cause, to an excess of from 50 to several hundred per cent. above the normal. The extra mortality caused by the influenza will continue for some time in the claims presented to the companies even if the influenza itself disappears, since many of these claims are not presented for some little time after the death of the insured. What seems more likely, however, is that the influenza will continue for some time at least in a less epidemic form than at its worst, and may even break out again in the acute epidemic form. Even in the most favorable case the losses from this cause will prove in the total much greater than shown in the two months mentioned, and even in those two months the losses from influenza were undoubtedly far greater for the companies of the country than the total of war losses from all causes during the whole period of the war.

The peculiarity of the Spanish influenza has been that four-fifths of the deaths were of ages under 40 and were largely of ages under 35. With reference to insurance this means that the policies held were policies of not very long duration, having, in consequence, small reserves, so that the real loss was much greater for the same amount of claims paid than if the deaths had occurred at higher ages where the policies would have averaged a longer duration and higher reserve.

Dividends.—In recent years competition between the companies has largely taken the form of paying the highest possible annual dividends. In 1918, although we were at war, there had been few death losses suffered from the participation of the United States, and only one or two of the prominent companies made any reduction in dividends on policies. The dividends for the year 1919, which depend upon the experience of the year 1918, will in many cases be reduced, and in some be passed entirely. Probably only one prominent company will pass dividends entirely, and in the case of most such companies, the reductions will not be large. There are many companies also which are maintaining their 1918 scale of dividends unchanged. Just how many companies will make reductions or pass dividends is not as yet known, but enough cases of important companies are known to make it certain the year 1919 will be recognized in the future as a year of reduction in annual dividends. The astonishing feature is not that reductions should be made, but that, notwithstanding the combined effects of the war and the influenza epidemic, many companies could continue their dividends unchanged, and that in respect to the companies reducing their dividends, the reduction was in the case of the prominent companies usually slight. It is a striking evidence of the stability and strength of the better companies that such a test should have no more effect.

Government Insurance for Soldiers and Sailors.—Besides providing free an income to dependents of soldiers and sailors losing their lives and also an allowance to the soldier or sailor himself in case of disability, the Government offered optional insurance to those in service up to a maximum of $10,000 each at a very low premium (*A. Y. B.*, 1917, p. 354). Early in November, 1918, it was announced that this optional insurance had reached the enormous total of over 36 billion dollars, an amount about equal to all the insurance in force in all the old-line and industrial companies and in all the fraternal associations of the United States (see also XV, *Labor*). In addition to this, the compensation furnished free in lieu of pension in the provision for dependents in case of death is equivalent to

UNITED STATES INDUSTRIAL INSURANCE COMPANIES

(*Insurance Year Book*)

Year	Number of Companies	New Business (millions)	Insurance in Force at End of Year		Premiums Received (millions)	Losses Paid (millions)
			Number of Policies (millions)	Amount (millions)		
1917	27	$1,050	38	$5,223	$303	$84
1916	28	998	35	4,811	275	76
1915	33	973	33	4,434	254	70
1914	31	861	31	4,163	237	64
1913	31	850	29	3,977	218	60
1912	31	840	26	3,707	199	53

more insurance, and the addition of this must bring the total Government insurance for soldiers and sailors well up towards 50 billion dollars. Much has been said of the low premiums charged by the Government for this optional insurance as compared with the premiums charged for insurance by the companies; an estimate places the death losses under this insurance up to late in the fall of 1918 at over half a billion dollars in excess of the premiums received. Thus it is the taxpayers who pay the greater part of the cost of the insurance, a perfectly proper thing, but something that should not be overlooked in any comment upon the premium rates. Much has been said also of the low expense shown in the soldiers' and sailors' insurance. The figures given, however, if analyzed, have no meaning, because most of the real expense was chargeable to other accounts, and no one knows what the total expense really is.

Besides furnishing compensation and insurance the Government also took measures to assist those in service having policies in the companies to maintain such policies in force, there being, however, some restrictions as to what policies were eligible for such assistance. The form of this assistance was that the Government, on request of the insured, secured to the companies the premiums payable during the war, the arrears to be paid later by the insured.

Now that the war is presumably over, the amount of Government insurance will not increase much, if any, but since those who have taken it have the right to exchange the temporary insurance for insurance on a permanent plan, a vast amount will remain in force for many years to come. The attitude of the companies and their representatives towards the Government insurance has sometimes been misunderstood; they have, almost universally, given hearty support to making the offering of the Government insurance to those in service a success, even when apparently to their own disadvantage.

Industrial and Fraternal Insurance.—The tables given below show that while industrial insurance is increasing, it has been at no such rate in recent years as ordinary insurance. Thus, 1917 compared with 1915 shows

UNITED STATES FRATERNAL ORDERS

(*Insurance Year Book*)

Year	Number of Orders	Assessments (millions)	Total Income (millions)	Claims Paid (millions)	Total Disbursements (millions)	Assets End of Year (millions)	New Business (millions)	Number of Certificates in Force, End of Year (millions)	Amount in Force, End of Year (millions)
1917	510	$140	$155	$97	$134	$280	$822	7	$9,129
1916	523	133	146	107	130	250	1,155	8	9,162
1915	472	122	133	98	123	212	922	7	8,694
1914	498	125	144	98	121	189	1,079	7	9,171
1913	509	129	144	101	121	183	1,065	8	9,622
1912	397	123	132	95	114	163	1,023	9	9,472

an increase in new business in industrial insurance of less than 10 per cent., whereas for ordinary insurance it was over 50 per cent. The tables also show with reference to fraternal insurance that it is hardly holding its own, 1917 showing new business less than any of the preceding five years and no tendency towards an increase in the amount in force.

PROPERTY AND CASUALTY INSURANCE

S. S. Huebner

Fire and Marine Insurance. — According to the *Insurance Year Book*, 692 fire- and fire and marine-insurance companies and Lloyds associations transacted business in the United States during 1917, as compared with 663 in 1916, 659 in 1915, and 633 in 1914. The capitalization of these companies and associations totaled $126,880,000, an increase of nearly 7.5 per cent. as compared with 1916, which year, in turn, represented an increase of nearly 9.7 per cent. over 1915. The total assets, exclusive of premium notes, of $1,093,364,000 show a gain of $110,332,000, or 11.2 per cent. This gain compares with 94 millions during 1916, 60 millions during 1915, 26 millions during 1914, and 17 millions during 1913. In other words, the gain in assets for the two years 1916-17 amounts to nearly twice the total increase of the preceding three years, 1913-15. Net surplus amounted to $408,198,000, a gain over 1916 of $52,178,000 (14.7 per cent.), as compared with a gain of only $25.889,000, or 7.7 per cent., in the preceding year. The increase of 1917 seems particularly large when compared with the gain of only $1,262,000 during 1914 and an actual decline of $1,701,000 during 1913. As was explained for the years 1913 and 1914 (*A. Y. B.*, 1914, p. 364; 1915, p. 378), the shrinkage in surplus for these years was largely the result of the exceedingly low range of security values prevailing at that time, whereas during 1915 and 1916, on the contrary, stock and bond prices averaged high. Owing to the decline in security values during 1917, it was predicted that a much less favorable showing in surplus might be anticipated; but to offset this important factor, the companies very substantially increased their rates on certain classes of business, with the result that during the year net premiums were increased by the huge total of nearly 159 millions and total income by 184 millions. These gains much more than offset the total increase in disbursements of 106 millions.

Net premiums and total income show increases during 1917 of $158,939,000 (31.1 per cent.) and $184,087,000 (33.4 per cent.), respectively. These figures compare with increases of $73,528,000 (17 per cent.) and $175,384,000 (36 per cent.) for 1916 as compared with 1915. Paid-for losses show an increase of $72,767,000, whereas the increase for 1916

FIRE AND MARINE INSURANCE COMPANIES[1]

Year	Number of Companies and Lloyds	Capital (thousands)	Total Assets Exclusive of Premium Notes (thousands)	Net Surplus (thousands)	Net Premiums (thousands)	Total Income (thousands)	Paid for Losses (thousands)	Paid for Dividends (thousands)	Paid for Expenses (thousands)	Total Disbursements (thousands)
1917	692	$126,880	$1,093,364	$408,198	$666,462	$734,097	$323,362	$45,279	$206,074	$574,716
1916	663	118,094	983,032	356,020	507,523	550,010	250,545	42,537	175,005	468,086
1915	659	107,674	888,700	330,353	433,995	474,626	226,867	29,839	159,568	416,275
1914	633	105,670	828,187	292,454	405,975	440,733	228,215	33,786	144,638	406,640
1913	645	105,195	801,918	291,192	385,367	421,598	204,797	34,266	143,033	382,097
1912	621	96,944	784,478	292,893	371,626	410,760	190,073	32,526	136,738	359,338
1911	621	97,703	754,344	283,201	358,623	392,966	184,917	33,291	129,474	347,683
1910	628	94,918	713,138	263,867	352,436	385,657	168,433	35,905	124,878	329,218
1909	636	87,638	668,194	243,414	333,862	365,264	156,369	31,217	116,964	304,552

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[1] Compiled from the *Insurance Year Book*.

was only $23,678,000. Total disbursements increased $106,630,000, as compared with $51,811,000 for 1916 and only $9,635,000 for 1915. Of the total disbursements, the amount paid for losses constituted 56.1 per cent., dividend payments 7.9 per cent., and expenses 35.9 per cent. The respective ratios of these items to total disbursements in 1916 were 53.4 per cent., 9.0 per cent., and 37.4 per cent.; and the same ratios for the year 1915, 54.3 per cent., 7.1 per cent., and 35 per cent.

Fully as remarkable a showing is presented by the summary of the annual report of the New York Insurance Department for 1917. Here it is shown that 280 fire, fire-marine, and marine companies, writing fire and marine insurance in New York State, had aggregate assets on Dec. 31, 1917, of $977,606,034, not including assets held abroad or premium notes of mutual companies, an increase of $109,991,148 as compared with 1916. Total liabilities of these companies, excluding capital stock, amounted to $572.915,537, an increase for the year of $95,465,355 over the return of the preceding year. The report also shows that while the total income of $670,606,866 represents an increase of $145,843,654, the increase in total disbursements amounted to only $90,441,662. The underwriting gain of the companies for the year, based on earned premiums, is found to be $32,828,758. The gain from investments of the above companies $11,068,681, a total gain of $43,897,439, from which must be deducted the loss in surplus of $34,617,829 from dividends declared, balance of remittances to and from home offices of fire and marine companies of other countries, and charges in special reserves, making a total net gain in surplus of $9,279,610 for 1917 as against a total net gain in 1916 of $15,866,029.

But mention should be made of the fact that dividend payments of these New York companies were increased during the year from $36,377,095 to $40,420,918.

The following table shows the combined risks and premiums of American and foreign companies operating in the United States for the past ten years, as reported by the *Insurance Year Book:*

	Amount Covered (000 omitted)	Premiums Charged (000 omitted)	Rate per $100
1907.....	$35,375,319	$402,874	$1.1389
1908.....	37,155,734	417,671	1.1241
1909.....	39,951,263	442,415	1.1074
1910.....	43,123,801	464,616	1.0774
1911.....	46,276,992	491,072	1.0612
1912.....	48,840,386	514,594	1.0536
1913.....	52,856,280	544,836	1.0308
1914.....	56,012,859	570,687	1.0189
1915.....	58,867,095	588,701	1.0000
1916.....	63,355,299	628,209	.9915
1917.....	72,331,660	698,276	.9654

Aggregate combined risks of 72¼ billions represent an increase of 14.3 per cent., as compared with 7.6 per cent. for 1916 and only slightly over five per cent. during 1915. The average rate per $100 of insurance is reported at $0.9654, as compared with $0.9915 in 1916 and $1.000 in 1915.

The rapidly increasing volume of property insurance in the United States is well explained by the Superintendent of Insurance of New York in his annual reports for the two years 1916-17 as regards the business done by all fire, fire-marine, and marine companies making returns to his Department. From these reports it appears that, in 1916, 275 companies were covering 71 billions of risk at the close of the year, and that during the year these companies undertook, for 763 millions in gross premiums, to carry 94 billions of risks, thus charging an average premium of about $0.8114 for every $100 insured. In 1917, however, the risks in force at the end of the year amounted to nearly 82 billions, and during the year 280 companies undertook for $1,003,000,000 in gross premiums to carry nearly 122 billions of risks, an average premium of about $0.823 for every $100 insured.

Fire Losses.—Heavy fire losses continue to be the chief adverse factor in the fire-insurance business, the paid-for losses during 1917 showing an increase of $72,817,000, as compared with an increase of $23,678,000 in the preceding year. The total fire waste for the country, as compiled by the *Journal of Commerce and Commercial Bulletin*, amounted to $267,560,640, as compared with $231,442,995 in 1916 (an increase of 15.6 per cent), and an average annual loss of about 220 millions. The significance

FIRE LOSSES

	1914	1915	1916	1917	1918
January	$23,204,700	$20,060,600	$21,423,350	$36,431,770	$37,575,100
February	21,744,200	13,081,250	24,770,770	29,587,660	20,688,155
March	25,512,750	18,786,400	38,680,250	17,523,000	20,213,980
April	17,700,800	18,180,350	12,681,050	18,597,225	20,108,900
May	15,507,800	11,388,450	15,973,500	24,968,800	20,545,900
June	29,348,000	10,893,950	12,247,500	15,513.270	24,890,600
July	17,539,800	9,006,800	23,013,800	16,143,050	24,537,000
August	11,765,650	10,067,100	10,745,000	21,751,100	31,476,650
September	14,383,050	14,823,500	12,244,625	13,814,490	13,434,300
October	14,004,700	14,465,850	17,701,375	26,384,450	75,412,300
November	21,372,750	21,204,850	19,898,450	20,198,025	12,333,750
December	23,507,150	20,877,100	22,063,325	26,360,300	15,737,750
Total	$235,591,350	$182,836,200	$231,442,995	$267,560,640	$317,014,385

of the 1917 increase is especially apparent when we recall that 1916 showed a loss of no less than 26.5 per cent. in excess of that recorded for 1915. A large portion of the increase, as was the case in the preceding year, is again attributable to the destruction of a considerable number of large warehouses and war manufacturing plants, current press accounts again indicating the possibility of incendiarism having played a prominent part in connection therewith. During 1917 the *per capita* fire loss in the United States amounted to approximately $2.55. An examination of the *per capita* loss for 328 cities with a population of 20,000 or more, as furnished in the *Insurance Year Book* from a report submitted by the Committee on Statistics and Origin of Fires to the National Board of Fire Underwriters, shows that in 80 the *per capita* loss during 1917 was over $3.00; in 40, over $4.00; in 29, over $5.00; in 19, over $6.00; in 13, over $7.00; in eight, over $9.00; and in three, between $10 and $14.37. As contrasted with these losses, mention may be made of the *per capita* losses for the following large European cities in 1916: London, $0.94; Birmingham, $0.69; Dublin, $0.66; Sheffield, $0.41; Glasgow, $0.44; and Milan, $0.35.

During the first nine months of 1918 fire losses averaged even higher than during the corresponding period of 1917, the total waste amounting to $213,470,585, as compared with $194,330,365, an increase of $19,140,220 or nearly 10 per cent. This unfavorable experience is again traceable chiefly to numerous large fires of warehouse, dock and wharf and manufacturing establishments. In fact, for these nine months 2,466 fires have been recorded which caused an estimated property damage of $10,000 or more each. The table above, compiled by the *Journal of Commerce and Commercial Bulletin*, presents the total monthly fire waste for the last five years.

Government Assumption of Railroad Risks.—The Railroad Administration announced in July that all fire- and other property-insurance policies carried by the railroads taken over by the Government would be dropped as soon as possible, and that henceforth the entire risk of fire or property loss or damage would be assumed by the Government. For the purpose of administering the plan, a new section, called the Section of Insurance and Fire Protection, was created in the Railroad Administration. This Section is entrusted with the duties of maintaining an ample force of inspectors on all Government-controlled roads and of making all necessary adjustments of losses with the companies. Although various sources of information in fire insurance circles have declared this branch of the business to have been on the whole an unprofitable one, the latest report of Director-General McAdoo seems to view the situation in a different light. In his report, covering the first seven months of the Railroad Administration's operations, he outlines the Government's effort to assume not only the insurance risk but to create an adequate and vigilant fire-inspection and fire-prevention service. He declares that premiums paid by the more important railroads to insurance companies during the three years ending June 30, 1917, amounted to $16,021,369, whereas the losses paid during the same period, including the famous Black Tom disaster, aggregated only $12,460,000. In addition to this estimated saving, attention is also directed to the reduction in fire waste that might be expected from the establishment of a fire-inspection and fire-prevention service.

Excess Fire Risks.—Owing to the risk connected with and the large values comprised in various munitions plants, storage plants and other forms of essential war industries, the principal fire-insurance companies found it desirable to form an association for the carrying of such excess risks as it was deemed unbusinesslike for individual companies to assume. Thus the fire companies adopted a plant similar in purpose and character to the Catastrophe Hazard Association created by the liability and accident companies. The plan of the new association, known as the Fire Underwriters' Excess Association, is to incorporate the following main principles:

(1) The Association deals only with surplus amounts which cannot be placed through regular companies and agency channels.

(2) The total cost to the members for commission or brokerage shall not exceed five per cent.

(3) Operations shall be conducted through the Association's office in New York, the manager and staff of which shall be under the supervision of an advisory committee of nine company officials.

(4) A joint policy or certificate shall be issued by the manager, who is vested by each company with binding power.

(5) Every member participates in each accepted risk on the basis fixed by the member for its interest, and each member's participation shall be obligatory.

(6) An open policy for each member shall be supplied for each state; and in states where members are not licensed, the open policy may be issued at the home office for the particular state or states, subject to local state laws. The open policy shall be the "standard" of each state, and where there is no such standard policy, the New York standard shall be used.

(7) The Association shall not conflict with such organizations as the Underwriters' Grain Association, and shall exempt properties coming under the jurisdiction of the latter.

(8) The Association's expenses shall be borne *pro rata* by each member according to its percentage participation in the Association.

Increase in Fire Rates.—Owing to the unsatisfactory rate situation during 1917, numerous rate increases were made on classes of risks which were alleged to have shown an unsatisfactory fire experience. In addition a general advance of 10 per cent. on all fire rates was put into effect throughout various states. The necessity for this increase has been attributed to increased volume of losses, depreciation of security holdings, increased taxes (including capital stock, income and premium taxes), increased cost of printing and supplies, increased postage, telegraph and telephone expenses, salary increases, and enhanced cost of material for replacing property partially destroyed or damaged by fire.

Alien Enemy Companies Suspended.—Toward the close of 1917, pursuant to the Trading with the Enemy Act, the Alien Property Custodian, acting under instructions of the Secretary of the Treasury, took over complete supervision of the United States branches of insurance companies incorporated in enemy or ally of enemy countries. These companies had previously been ordered to cease writing business on Dec. 9, 1917, and from entering into new reinsurance contracts after Jan. 11, 1918; but existing contracts were allowed to run until their regular expiration. Attention is called to this matter because of the large volume of business transacted by the companies which have ceased to operate because of the Government's action. At the close of 1916, the American branches of 15 fire- and marine-insurance companies affected by the order had total insurance in force of $3,656,400,000, assets amounting to $38,510,154, and a total premium income for the year of $30,665,625.

Marine Insurance. — The marine branch of the insurance business, judging from the returns of companies confining themselves entirely to this branch of underwriting, experienced very satisfactory progress during 1917. The extent of this prosperity may be judged by the showing of the 42 marine companies reporting to the Insurance Department of New York State, although it should be noted that a large number of fire-insurance companies reporting to this Department also write marine risks. According to the report, the 46 companies had marine risks in force at the close of 1917 of $1,336,411,649, an increase of $112,292,214, or 9.2 per cent. over the total volume of insurance outstanding at the close of 1916, and the latter year, in turn, represented a stupendous gain of 41 per cent. over the preceding year. The present volume of 1,336 millions is nearly twice the volume of 1914 (678 millions). Premiums received increased from $28,013,171 at the close of 1915 to $42,137,536 at the close of 1916 (50 per cent.) and to $64,287,632 at the close of 1917, or another annual increase of 52 per cent. Paid-for losses, however, show an increase of 57.4 per cent., from $16,936,442 to $26,669,219. Total income increased during the year from $50,829,694 to $78,243,615, or 54 per cent. Despite the great increase in paid-for losses, the premium and total income of these companies was so much larger as to increase the net surplus from $24,964,801 to $35,645,675, or nearly 43.4 per cent.

According to the annual report of the New York Superintendent of Insurance, the amount of marine and inland risks written in the state during 1917 by fire and fire-marine companies was $11,834,758,740, as against $2,535,376,232 in 1916. Marine and inland premiums received in New York State during 1917 amounted to $90,819,202, and the losses incurred to $41,147,227, thus indicating an apparent net excess of marine and inland premiums over losses incurred of $49,671,974, a truly remarkable showing. As indicating the conspicuous position that marine insurance has suddenly assumed in the field of insurance, the Superintendent of Insurance of New York also states the following in his annual report:

> Some idea of the growth of the business may be gained from the Department records, which show that previous to the breaking out of the European War there were on January 1, 1914, 58 companies or associations authorized by this State to carry on the business of marine insurance, while on January 1, 1918, there were 109 companies or associations so authorized. War risk insurance is an important contributing factor to the increased business, but the additional volume likewise reflects an extension of domestic trade to foreign countries.

War Risk Insurance.—The four previous issues of the Year Book explain the several extensions in the functions of the Bureau of War Risk Insurance that were made from time to time (*A. Y. B.*, 1914, p, 368; 1915, p. 381; 1916, p. 376; 1917, p. 360). Another important extension in the scope of this branch of Government insurance was effected by an amendatory Act of July 11, 1918. This Act provides that:

> When it appears to the Secretary of the Treasury, that vessels of foreign friendly flags, or their masters, officers, or crews, or shippers, or importers in such vessels, are unable in any trade to secure adequate war risk insurance on reasonable terms, the Bureau of War Risk Insurance . . . is hereby authorized to make provisions for the insurance by the United States of (1) such vessels of foreign friendly flags, their freight and passenger monies and personal effects of the master, officers and crews thereof against the risks of war when such vessels are chartered or operated by the United States Shipping Board or its agent, or chartered by any person a citizen of the United States, and (2) the cargoes to be shipped in such vessels of foreign friendly flags, whether or not they are so chartered.

At the discretion of the Secretary of the Treasury, the Bureau was also authorized by the Act to issue insurance in the above circumstances for the protection of masters, officers, and crew against loss of life or personal injury and for the inclusion of compensation during detention following capture.

Since the creation of the Bureau on Sept. 2, 1914, and to the close of business on July 30, 1918, $1,244,671,238 of marine insurance was written. Paid-in premiums aggregated $43,185,776 during the same period, and losses amounted to only $28,894,848. After allowing for all costs of administration, there remained a surplus of over $14,000,000 in the Treasury. The cost of administration for nearly four years is reported to have been only about $130,000.

The Bureau decided late in the year to raise its rates to about those prevailing in the open market. It will no doubt follow that a considerably larger share of the marine-insurance business will go to private underwriters. Previously, by keeping its rates lower than the open-market rates, the Bureau received a larger proportion of the total risks, good and bad. In England, on the contrary, where the Government rates were rigid, a highly adverse selection of risks against the Government occurred, *i. e.*, private underwriters obtained the choice business on which they were willing to quote rates lower than the Government's figure, while undesirable risks calling for rates higher than the Government quotations naturally went to the Government Bureau. Despite the U. S. Government's practice of charging lower rates than those prevailing in the open market, private underwriters continued to obtain the cream of the business, chiefly because of their prompter service and greater readiness to adapt themselves to the commercial needs of the shipping world.

Self-Insurance Plan of the Emergency Fleet Corporation.—In March the Emergency Fleet Corporation announced in its publicity organ, the *Emergency Fleet News*, that it had put into effect a plan of self-insurance in connection with all properties in which the Corporation is interested, as well as with vessels being built throughout the country. The plan also includes the assumption of insurance risks on plants and other construction and extension work undertaken by the Corporation as owner, including the manufacture and transportation of materials where such interests are solely at the Corporation's risk. The Corporation briefly described the plan as follows:

> The principle of self-insurance, as it applies to properties and vessels owned or under construction for the Emergency Fleet Corporation, was determined upon by officials of the Corporation after exhausting study. It has always been the practice, in connection with vessels in course of construction, for an owner to require the shipbuilder to furnish insurance of the broadest nature to protect the owner for cash advances or other investments made during the process of building. This method of self-insurance constitutes a new departure in protection of shipbuilding risks.
>
> In view of the fact that builders are relieved of the necessity of placing insurance, the risks of building being assumed by the Insurance Fund, a deduction is to be made from the contract purchase price paid for each vessel equivalent to the sum that would otherwise have been paid for the customary insurance protection. The sums so deducted are to be held in reserve to cover any losses which might occur.
>
> The protection afforded by the Insurance Fund on vessels in course of construction extends to the same risks that are covered by the form of insurance invariably carried by shipbuilders. This form of insurance or policy is known as "Institute Builders Risk Clause", and provides security against losses of the most liberal character. The risks covered in plant properties and on materials include loss or damage caused by fire and lightning and also the customary risks of transportation where a movement of materials is made. Marine floating equipment owned by the Emergency Fleet Corporation also is subject to the arrangement of self-insurance against loss caused by the perils of the sea. Proper reserve will be made for all risks undertaken.

On Aug. 20 it was officially announced that up to July 29 approximately $30,000,000 had been set aside by the Shipping Board, under this plan of insurance, and that the estimated losses of all kinds suffered by the Emergency Fleet Corporation amounted to about $13,500,000.

Government Insurance of Cargoes on Federal-Controlled Ocean Lines.—The Railroad Administration announced in September that consignments of freight delivered for shipment to Federal-controlled ocean lines would henceforth be automatically protected by Government insurance. In other words, the Government extended its plan of protecting shipments by rail to water transportation also. All ocean lines under its control were authorized by the Railroad Administration to assume the marine risk without extra charge and without changes in the present transportation rates. Settlements in case of loss will be determined upon the basis of the value of the property at the time and place of shipment.

Liability and Compensation Insurance.—The extent of employers'-liability and workmen's-compensation insurance is indicated by the premiums written and losses paid by 45 companies writing liability contracts and 62 companies (42 stock and 20 mutual companies) transacting workmen's-compensation insurance. According to the *Insurance Year Book*, the liability premiums of these companies for 1917 amounted to $51,791,032, the losses paid to $24,034,260, and the ratio of losses to premiums to 46.3 per cent.; for 1916 the corresponding figures were $42,458,213, $22,262,841, and 52.2 per cent. On workmen's-compensation policies the premiums amounted to $79,209,346, the losses paid to $38,127,758, the ratio of losses to premiums for the stock companies to 50.2 per cent., and for the mutual companies to 36.9 per cent.; for 1916 compensation premiums amounted to $57,247,829, losses to $28,519,769, and the ratio of losses to premiums for stock and mutual companies to 44.3 per cent. and 27.1 per cent., respectively.

In addition to the foregoing record, the following four legislative events deserve special notice in this field of insurance (see also XV, *Labor Legislation*):

(1) The passage of a new workmen's-compensation law by Virginia on March 20, 1918, effective on Jan. 1, 1919. This compensation act is said to be one of the very few that have been passed over a governor's veto. Security for the compensation must take the form of insurance in any authorized stock or mutual company, or in a state fund created for the purpose, or by self insurance when duly approved by the administrator of the law. (See also XV, *Labor Legislation.*)

(2) The passage (effective May 13, 1918) of an important amendment to the New York compensation law, whereby all employments involving four or more regular workmen (except farm laborers and domestic servants) are brought within the scope of the law.

(3) The creation (effective July 4, 1918) of a Workmen's Aid Bureau in the Labor Department of New Jersey, which is to have exclusive original jurisdiction to hear all claims under the workmen's-compensation law and to approve all settlements. Another amendment to the New Jersey law provides that in case an employee entitled to compensation should die without leaving dependents, the employer shall pay $400 to the state treasury.

(4) The extension (effective June 18, 1918) of the Kentucky Workmen's Compensation Act to cover all employers having three or more employees.

(5) The ruling of the Commissioner of Internal Revenue in September, in response to an inquiry from the comptroller of the Massachusetts Bonding & Insurance Co., to the effect that benefits received by injured workmen on their beneficiaries under workmen's compensation polices are not subject to the Federal income tax.

ACCIDENT AND HEALTH INSURANCE

	Accident Insurance			Health Insurance		
	Premiums	Losses	Ratio of Losses to Premiums (per cent.)	Premiums	Losses	Ratio of Losses to Premiums (per cent.)
1917	$43,575,777	$21,529,738	49.3	$9,658,042	$4,769,648	49.3
1916	43,043,546	19,159,528	44.5	9,292,065	4,501,239	48.4
1915	36,977,988	17,197,415	46.5	7,891,030	3,705,713	46.9
1914	36,524,812	16,304,776	44.7	7,594,840	3,533,656	46.5
1913	34,522,481	15,581,234	45.0	6,928,735	3,256,227	47.0
1912	29,792,473	13,408,552	45.0	6,339,406	3,126,160	49.0
1911	27,351,626	11,837,347	43.2	7,101,666	3,314,301	46.6
1910	23,894,665	10,068,926	42.1	6,451,028	2,770,744	42.9
1909	21,446,506	8,248,182	38.4	5,714,579	2,173,386	38.0

Accident and Health Insurance.—The accompanying table, compiled from data furnished by the *Insurance Year Book*, shows the premiums, losses, and loss ratios in the accident and health-insurance business for the past nine years. Accident premiums written by 99 companies during 1917 total $43,575,777, or about the same as the total reported for 119 companies for 1916. The ratio of losses to premiums, however, increased considerably, namely from 44.5 to 49.3 per cent. In health insurance the premium income of 43 companies, writing health insurance separately, totaled $9,658,042, a gain of about half a million over the total for 49 companies reported for 1916. The loss ratio increased slightly, from 48.4 to 49.3 per cent.

Fidelity Insurance and Corporate Suretyship.—The combined results in the fidelity and surety business during 1917 show premiums received of $29,124,000, losses paid of $7,983,000, and a ratio of losses to premiums of 26.8 per cent. Considered separately, 37 companies received on their fidelity business $10,058,342 in premiums, paid losses of $2,566,316, and experienced a ratio of losses to premiums of 25.5 per cent.; the corresponding figures for the previous year were $8,878,316, $2,406,335, and 27.1 per cent. Thirty-six companies received on their surety business $19,066,576 in premiums, paid losses of $5,416,949, and reported a ratio of losses to premiums of 28.4 per cent; for 1916 the corresponding figures were $17,003,753, $4,362,319, and 31.4 per cent. The results in this business for the past nine years are indicated by the following table compiled from the *Insurance Year Book:*

	Premiums (thousands)	Losses (thousands)	Ratio of Losses to Premiums (per cent.)
1917......	$29,124	$7,983	26.8
1916......	25,882	6,768	26.3
1915......	22,732	7,321	32.0
1914......	21,270	7,975	37.5
1913......	20,027	6,947	34.6
1912......	19,243	5,192	27.0
1911......	16,958	4,980	29.3
1910......	15,473	2,814	18.1
1909......	13,283	3,200	24.0

MISCELLANEOUS INSURANCE IN THE UNITED STATES, 1917[1]

TYPE	Number of Companies	Premiums Written	Losses Paid	Loss Ratio (per cent.)
Plate Glass..........................	39	$5,906,931	$2,899,218	49.0
Burglary and theft....................	38	6,476,993	2,686,052	41.4
Steam Boiler..........................	12	3,599,334	347,331	9.6
Fly-wheel.............................	10	398,090	50,478	12.6
Credit indemnity......................	4	1,666,160	96,675	5.8
Automobile and teams property damage...	42	14,696,116	6,546,323	44.5
Workmen's collective..................	20	354,784	193,562	54.5
Sprinkler leakage.....................	3	357,456	142,244	39.7
Live stock............................	6	1,031,878	463,560	44.9

[1] Table based on information compiled in the *Insurance Year Book* for 1917.

Miscellaneous Forms of Insurance.—The importance of the remaining forms of insurance is indicated by the following table, which represents the 1917 record for the nine leading kinds of insurance coming under this head as regards premiums received, losses paid, and the ratios of losses to premiums. The total premium income for all these types of insurance aggregated $34,487,742, and total losses paid amounted to $13,425,443. Exclusive of live-stock insurance (not recorded in the table in the YEAR BOOK for 1917), this year's aggregate figures for the eight leading types of insurance under this heading show an increase of nearly 28 per cent. in premiums received and 37.2 per cent. in the losses paid. With the exception of workmen's collective and steam-boiler insurance, the premiums written show a substantial increase in all instances.

XIV. SOCIAL AND ECONOMIC PROBLEMS

SOCIOLOGY

Herbert N. Shenton

Sociologists and Statisticians and the War.—The war emergency of the past year, and no less the months of readjustment, have made most drastic demands upon the sociologists and social statisticians and they have responded universally. Some formulated and taught to our citizen army the social aims of the war, others educated the public; some advised in high places as to the formulation of social policies, internal and international, others themselves brought to pass social achievements of many varieties; some undertook special research or turned social science laboratories into training schools to supply the corps of statisticians absolutely essential to mobilization of men and resources, and others defended their principles on the firing line. In these and in other ways they translated their social theories and philosophies into action. As a result, the products of their work are not to be found entirely in the usual academic forms but in records of social achievement and in the organization of source material.

Social Achievements.—The year has witnessed the greatest mobilization and migration of population in human history. It has seen organized waves of suggestion and stimulation develop a social consciousness that has made possible collective achievements hitherto considered impossible. It has seen a social order of peace, toleration, and free competition turn into one of war, control, conservation, and coöperation, which has again commenced to readjust itself to peace conditions. It brought to pass a socialization of remote communities so complete that the Rainbow Division has become symbolic of the nation, and the greatest and most effective international alliance of the ages has become a reality. Social mores and institutions have been shattered, modified, transformed, or exalted almost over night as our democratic society performed nothing short of miraculous adaptations to new conditions. A part of this story is told by Albert G. Keller, who has used the evolutionary theory which he formerly stated in his *Societal Evolution* in a presentation of the social struggle in a volume, *Through War to Peace.* The work contains an interesting discussion of the reassembling of the mores of a peace group when its safety and that of other peace groups are menaced.

Sociological Sources.—The primary handicap of the sociologist has been his limitation in laboratory experiments. The war has given him multitudinous and magnificent phenomena for observation, and in many cases the conditions and the phenomena have been fairly accurately recorded. There are records of scores of thousands of community organizations, of their response to common stimulation, of the conversion of mores and institutions, of the development of morale, of the expansion of consciousness of kind, and of collective efforts at social self-control inspired by new appreciations of social responsibility. These include the records of the stimulation of social effort for mobilization, increased production, conservation, labor and industrial adjustments and coöperation, investment, thrift, and the support of voluntary organizations. In addition to these records of social activities are records of demotic condition and of social relations. Among these latter are the records of the registration boards, the primary regret being that they are not complete between the ages of 18 and **45.**

Supplementing these records will be those filed as a basis for income tax. Besides there are the records of the Bureau of War Risk Insurance, of the Medical Corps, and other military and naval records.

Democracy.—The war to "make the world safe for democracy" has been won and won by democratic states. Millions of men and billions of dollars have been sacrificed in order that men might live in states responsible not to dynasties but to the whole of their peoples and each considerate of the welfare of the others. The task of assisting in the creation of such democratic states out of social chaos and the task of developing a newer and larger democracy are now confronting us. Franklin H. Giddings is one of the first sociologists to help us toward clear thinking concerning the fundamentals of the problem. In *The Responsible State* he discusses the origins, the powers, the rights, and the duties of the state, setting forth what constitutes a responsible state, how it has been developed, and how it compares in character with an irresponsible state. This state or social system "will become not simpler, but more complex; not harder and more resistant, but more adaptive; not more authoritative, but more intelligent." Helen Marot, in her *Creative Impulse in Industry*, reminds us that in industrial democracy "we need to foster and develop the opportunity as well as the desire for responsibility among the common people." She then contends that nations cannot realize concepts of political democracy until they reach in a large measure the democratic administration of industry which is to be made possible through the realization of creative impulse in the associated efforts to produce. *Frontiers of Freedom*, by Newton D. Baker, Secretary of War, is full of suggestions as to how social morale based on the realization of collective responsibility for human welfare was fostered both in the Army and among the civilian supporters. The speeches collected in this book were actual efforts of the Secretary to create an army inspired by distinct and definite ideals of democracy for the defense of which they would be willing to die, or, if spared, for the attainment of which they would forever strive. Perhaps the most valuable contribution to general sociological theory during the year is Charles H. Cooley's *Social Process*, which also will be of value to those who are endeavoring to orient themselves in the present rapid social revolution. Charles A. Ellwood has discussed "Democracy and Social Conditions in the United States" (*Int. Jour. of Ethics*, xxviii, July 29, 1918), and Harry E. Barnes has written an exceptionally informing article entitled "An Outline of the History of Democracy" for the 1918 edition of the *Encyclopedia Americana*. The article is followed by a carefully selected and well classified bibliography. The religious stimulation needed for the attainment of the social democracy is discussed by Harry F. Ward in "The Religion of Democracy" (Federal Council of Churches of Christ in America), and by Charles A. Ellwood in "Religion and Social Control" (*Scientific Monthly*, October, 1918).

Social Readjustment and Reconstruction.—The war has left us socially abnormal and disarranged. We have our choice of one of three policies of social readjustment. One has for its objective a *status quo ante bellum*, another some idealistic norm, and the third has no objective save the working out of improvements in social conditions, social relations, and social behavior. Let us hope that we will follow the latter. Even our economic reconstruction should not be evaluated primarily in terms of production, exchange, and consumption, but in the terms of the kind of society produced by these economic processes. Old values are lost forever, and with them are gone many of the old customs, traditions, and other inhibitions. There has been an emancipation of individuals and at the same time a socialization and a new appreciation of interdependence of cooperation. Nations are as never before, societies responsible for their self-control both to their own constituents and to other nations, and a new emphasis is placed on what societies are as compared with what they possess. Speaking in social terms, at present all things seem possible. We may follow the conservative first policy and to the extent that we do so hold back the wheels of progress; we may follow the second and find ourselves in anarchy; or we may follow the third and give birth to a new social epoch. All mankind must make the final decision, but much of the responsibility for leadership in clear thinking unquestionably rests with the sociologists.

Sociology and Education.—The annual session of the American Sociological Association was devoted to the general subject "Sociology and Education." Papers on "Sex and Race Aspects of Education" were presented by Anna Garlin Spencer and Robert E. Park; on "Sociology in the Common Schools," by F. R. Clow, John M. Gillette, and Walter R. Smith; on "Social Education through the Community," by John Collier, Cecil C. North, and John Phelan; and on "National Aspects of Education," by E. A. Ross, L. M. Bristol, and H. A. Miller. "The Relation of Social to Economic Theory" was discussed by Wesley C. Mitchell, and the presidential address was made by Charles A. Cooley. The secretary of the Association is Scott E. W. Bedford, 58th Street and Ellis Ave., Chicago.

SOCIAL WORK AND THE WAR

William T. Cross

War-Time Problems and Tendencies.—A concentration among groups interested in social betterment and an emphasis of the ideals of organized social work were easily predictable from the circumstances of the war. Altruistic motives have been predominant. These are traceable not only to the detached interest of the United States in the war, but also to the prominence of systematic social service in America during the last decade. The natural and ready functioning of this country in international affairs, as food and relief dispenser and sustainer of morale, has proceeded largely out of previous experience with undertakings of this sort at home. More immediately, this concentration in social work has been quickened by the participation of staffs of welfare agencies, as units, in war service. Finally, great programmes of activity requiring the coöperation of legislative and administrative bodies, state and local, of voluntary groups, and of individuals have issued from Washington. Instant, intelligent response has been desirable. Therefore, as a reflection of standards of national action there has been an unparalleled tendency toward unification of social efforts.

The National Conference of Social Work at its Kansas City meeting in 1918 served to focus attention upon common problems of local and national agencies in this new era of national experience. That the church in its community relationships in the crisis of war had come upon new opportunities of leadership was recognized and discussed. That child-welfare movements heretofore have been limited in scope and concerned chiefly with pathological conditions was demonstrated. The possibilities of comprehensive educational undertakings as exemplified in Children's Year (see *Child Welfare, infra*) were shown, and the pivotal relationships of the public school were recognized in future plans for the Conference. Unification of legal administration through the medium of domestic-relations courts was advocated. Experiences with the girl problem in connection with military camps threw a flood of light upon both public health and corrective measures (see also *Social Hygiene, infra*). Further, as a result of this focalizing influence of war requirements, new standards of state and municipal organization of welfare work were proposed. The reform of county administration and better establishment otherwise of units of social activity also were traceable to the same war-time interest. A new tack in family rehabilitation was taken, largely as a result of developments in the Home Service of the Red Cross (see *infra*). The causes of industrial unrest were probed, and a frank appraisal of radicalism made. Rural sociology notably was in the foreground. War-time accumulation of valuable social data, the future of existing welfare agencies, and the art and science of forming public opinion, and many kindred topics were developed on the platform of the Conference as a direct reflection of demands of the last 18 months.

The din of the celebration of the armistice had not died down before representatives of leading humanitarian agencies undertook the discussion of practical plans for after-war adjustment. Two meetings of this nature, initiated by the staff of *The Survey*, have served to clear the path for adjustment to a peace basis. A striking tendency toward correlation of reform associations in the reconstruction era was apparent on these occasions.

Community Life and the War.—The community conception and unit of action has had unprecedented emphasis during the year. The development has been characteristically in the nature of an alignment of local forces under stress of national needs. Nevertheless, the newer forms of coöperation have been in keeping with that growing appreciation of neighborhood values which preceded the war. The spread of the idea of community councils of national defense is to be noted. This plan has been most elaborately worked out for Greater New York by the Mayor's Committee on National Defense. It provides, through uniform neighborhood organizations with definite territorial limits, for mediation directly from citizen groups to National Government and allied agencies of information and service in winning the war. Another typical development has been the community kitchen. As distinguished from similar neighborhood institutions abroad, which are primarily publicly operated kitchens, those in this country have been demonstration centers. They have had beneficial results far beyond the field of domestic science, especially in respect to Americanization and neighborhood spirit. The successful conduct of a neighborhood store and of a trade school at Hudson Guild, New York, likewise has come to the general public attention during this period. The accumulation of experience by certain draft boards has been an incident of primary importance, both for the future of Americanization work and for the better understanding of social problems of foreign neighborhoods—the most crucial field of operation of social settlements. Indeed, the value of draft-board experience seems to apply with equal validity to many typically American neighborhoods, rural as well as urban. Neighborhood improvement associations have proved useful during the war, and their underlying principles seem to have become better established. The same may be said also of the unique social-unit experiment at Cincinnati.

Territorial units in social endeavor have presented problems in 1918 as never before. This has resulted chiefly, perhaps, from two causes: the requirements for widespread propaganda, and the concern of those engaged in civilian activities with agencies following widely different plans of territorial organization. First of all, rural districts have come to be recognized as of greater importance for humanitarian efforts—Red Cross, food conservation, etc. The farmer's radius of contacts, natural forms of social activity in rural districts, the adaptation of programmes of national associations and of nearby city agencies to needs of the open country, have been studied as never before (see also *Recreation*, and *Child Welfare, infra*). At the National Conference of Social Work in May occurred a series of discussions of the village as a factor in social progress, the country as a unit in social work, the coördination of welfare activities of cities, and the organization of the social forces of the state.

Family Welfare and the War.—No year in history has equaled 1918 for the development of organized means of service to individuals and families. Upon a fabric of systematic case work for needy families in the larger cities of the United States, having in some instances a history of 40 years, has been built a comprehensive plan of Red Cross Home Service (see *infra*) which reaches soldiers' families in every community, even the most inaccessible rural districts. This has been a patriotic service, under auspices other than the pre-war charitable agencies. The class of cases has been noticeably different, and their responsiveness to service rendered far more encouraging. A flood of new light has been thrown on the whole problem of organized human assistance. Speculation has arisen as to the location of the "poverty line." The data of this new experience are still uncompiled and unanalyzed. Only the most general observations are to be made, as, for example, of the fact that the war and the widespread organization of home service have proven of advantage in the process of steadying previously unstable family relationships. Central registration or clearing of charitable cases has been stimulated in many communities by circumstances of the war. An increase of interest in family budget making and supervision has been observable. Poverty of the types treated by charitable agencies in existence before the war may have decreased somewhat, although there has been no general survey to establish this as a fact. Statistics have been given, for example, showing that outdoor relief in Massachusetts dropped from an average of 96,705 cases for the years 1915 and 1916, to 78,090 cases for 1917, and the statement has been made that the tendency continues downward. Statistics of the Buffalo Charity Organization Society show a steady decrease in total number of families cared for since 1915, but the number of new families which the Society has cared for during the same period exhibits a steady increase at about the same ratio during the period. A practical wiping out of the item of relief on account of unemployment by the Buffalo Society during these three years is especially significant. In the same classification, relief on account of unemployment, the United Charities of Chicago has experienced a decrease of 32 per cent. in number of cases. This decrease is a most interesting matter for consideration, in view of the fact that the number of cases aided for lack of sufficient earnings increased by exactly the same ratio, 32 per cent. The relationship to wages and standard of living during this unusual year is further indicated by the experience of the Chicago organization in having to increase its amount of relief per case by this same ratio of 32 per cent. (See also *Unemployment, infra.*)

Home Service of the American Red Cross.—Shortly after America's entrance into the war, the American Red Cross under the authorization of the War Department set about creating a nation-wide organization to help to maintain the morale of our fighting forces by safeguarding the welfare of their homes. This work is known as Home Service. Its object is to assist soldiers' and sailors' families to preserve the essential standards of home life; to meet problems arising out of diminished income, sickness, care, discipline and education of children, household management, business and legal difficulties, unsatisfactory working conditions, loneliness, mental depression or defect, vice, or physical disability; and to furnish information about the war-risk insurance law, how to proceed to procure Government allowances, compensation and insurance, how mail should be addressed to soldiers and sailors, and how to obtain news of wounded, captured or missing relatives.

To accomplish this object Home Service sections have been provided for in every Red Cross chapter. These are composed of men and women who are responsible, representative members of the communities which the chapters represent. Especial attention has been paid to making Home Service sections representative of the important racial and religious and professional elements of the community. Roman Catholics, Protestants, Jews, physicians, lawyers, educators, and social workers are included in the membership. Each section has an executive secretary, usually assisted by a staff of volunteer and paid workers. The assistance of the Home Service is made readily accessible to soldiers' and sailors' families in all parts of the territory included within the jurisdiction of Red Cross chapters through the establishment of branches.

The Home Service sections number about 4,000, with 10,000 additional branches in smaller communities. There are approximately 30.000 Home

Service workers regularly enrolled in the United States. More than 350,000 families of American soldiers and sailors have received financial or other assistance since April, 1917. The work is financed by funds raised locally. Money has been the least of the services given, yet the total amount expended in Home Service up to the end of 1918 is about six million dollars.

Attached to the Red Cross staff in each army cantonment and to army units abroad are Home Service representatives to whom soldiers who are troubled over family problems are referred, and through whom the helpful services of the Home Service workers in the families' home communities are invoked. In communities in the vicinity of cantonments the Red Cross has placed special Home Service workers to cope with the grave and urgent problems growing out of the migration of soldiers' families to such places. Through these representatives the Red Cross has provided many helpless families with food and shelter, medical care, and transportation back to their homes.

Home Service extends also to the after-care of enlisted soldiers and sailors. The medical departments of the Army and Navy will retain such men in the service until they are cured or as nearly cured as the nature of the disability permits. Congress has authorized the Federal Board for Vocational Education to provide for the training and employment of all who are unable to return to their former work (see *Vocational Education, infra*). The war-risk insurance law offers liberal compensation and insurance benefits. It remains for the Red Cross through its Home Service sections to encourage the man, both directly and through the influence of his family, to take the fullest advantage of the care which the Federal Government is ready to bestow upon him. Meanwhile the same assistance that was rendered to his family while he was at the front must be continued during the weeks or months that he is undergoing hospital treatment and vocational training—until, in fact, he is successfully reëstablished in civil life and able to make his own way.

The development and direction of the Red Cross Home Service organization centers in the Department of Civilian Relief, which operates through 14 division bureaus of civilian relief. The division bureaus of civilian relief supervise and standardize the work of Home Service sections by means of field visits of inspection, group conferences, correspondence, and printed instructions. In all the larger cities the executive direction of Home Service work is in the hands of experienced social workers. In about 2,000 places the executive secretary of the Home Service section is a worker of experience and training. That trained leadership may be afforded the smaller communities as well, 25 Home Service institutes have been established in as many different centers of population. These institutes are affiliated with universities, colleges or technical training schools. They provide a six weeks' course of classroom and field work. Since October, 1917, more than 1,100 students have been graduated. For Home Service workers who are unable to attend an institute, chapter courses are provided in the home communities. Approximately 7,000 persons have attended chapter courses on home service during the year.

Thus far there has been a notable absence of duplication in the field of safeguarding the welfare of soldiers' and sailors' families. Organizations which have been founded by private, local groups have proved sporadic, being quickly abandoned when their sponsors found that the Red Cross was organized to do and was in fact doing for soldiers' and sailors' families what their needs required and what the public expected. The three national agencies which deal with soldiers' and sailors' families, the Federal Bureau of War Risk Insurance, the Federal Board for Vocational Education and the American Red Cross, work in close, planned coöperation.

The War Chest and Other Aspects of Financing Charities.—The financial aspect of charitable endeavor has had unprecedented emphasis during the war. Local charities have had to raise and spend more than in previous years, and—far greater than these nearby obligations—the American public have assumed the duty of sending material comforts and of supporting agencies for the maintenance of physical wellbeing and morale of our troops abroad and for giving similar assistance to the civilian populations of Allied countries. The frequent recurrence of financial appeals and the great variety of agencies calling for funds, perhaps as much as the amounts appealed for, have awakened the general public as never before to the distinctly financial phases of charity. The most widely heralded single incident of the year in this respect, perhaps also the most far-reaching in its educational effects, was the United War Work Campaign, which occurred in November. The war-work budgets of the following organizations were included in this appeal: American Library Association, Jewish Welfare Board, Knights of Columbus, Salvation Army, Young Men's Christian Association, Young Women's Christian Association, War Camp Community Service. To Dec. 31, $205,180,793 was reported in subscriptions. Quotas were assigned to states and communities, as has become customary in money-raising efforts during the war.

An early realization of the public interest involved in the raising of funds for charities, especially for war charities, during war times, led to the adoption by the Councils of Defense of nearly all states of plans for supervision of solicitation of funds. In about half of the states lists of approved agencies have been published. In a few the practice was followed of issuing permits to representatives of approved agencies, and mandatory powers of action in this respect have been given the State Councils in a few commonwealths. The American Red Cross is the only organization that has been given endorsement by the Council of National Defense. However, those agencies listed above as participating in the United War Work Campaign have had the endorsement of the Commissions on Training Camp Activities of the War and Navy Departments. The principles on which endorsements may be based seem not to have been publicly stated, although it is apparent that always the reliability of the organization has been considered, and in some cases the question of whether or not the agency duplicates others in existence. Rules for the disbursement of funds once collected seem not to have been extensively or uniformly adopted, although the subject has had the attention of several of the State Councils of Defense.

The war chest has been the most typical and original plan of organization to develop out of this experience with financing charities in war time. It is an expression chiefly of the dominant interest of the local community in the procedure of financing. The most striking developments have taken place in those cities where coördination of charities, and in some cases financial federations, were previously well advanced. The questions of distribution of funds among local agencies, of admission of particular agencies into the joint efforts, and of inclusion of local needs in the war drive have naturally been embarrassing matters for those chiefly interested in providing ample funds for war-time activities. State Councils of Defense have been divided in their opinions regarding the advisability of the war-chest plan. The Council of National Defense has not taken any decisive action. In favor of the plan, so far as the average citizen is concerned, might be listed all that has been said during the war respecting coöperation, concentration of forces, and conservation of resources, as well as the practical success that has been met in providing amply and quickly for local and national needs under the community war-chest plan. On the other hand, the chief obstacles seem to have been the finer questions of harmony of local and national requirements, and of certification of and distribution of funds among participating agencies in the local community. The war-chest idea is said to have been adopted in as many as 400 cities and counties in the country. Cleveland, Philadelphia, Rochester and Syracuse are among the cities that adopted the idea early in the war. Coincident with the spread of the war chest, the plan of local federation of charities (*A. Y. B.*, 1917, p. 410) has expanded. This permanent value in the coördination of agencies seems to have been a dominant consideration in Detroit, Indianapolis, Toledo, Rochester, Minneapolis, and other cities. Thus the pre-war tendency toward federation of local charities continues into the reconstruction period with this newly acquired war-time experience and momentum.

The National Investigation Bureau, another war-time institution, likewise appears on the threshold of peace with pre-war history and origins. This bureau was established in October, 1918, by the war chest associations of Cleveland, Syracuse, Indianapolis, Columbus, Detroit, Rochester, Philadelphia and Toledo. Its purpose is announced as being "a thorough investigation of war charities and related activities which appeal to war chests and to individuals for the support of their work." Its plans, as formulated then, included the sending of investigators abroad to study the operation of distinctly war charities. The plan was approved by the Secretary of War. The new organization has assumed the double *rôle* of critic and adviser to agencies in respect to their methods of work, administration, accounting, etc., so as to increase public confidence in them. Eight specific standards for judgment as to the worthiness of these national agencies are announced. The Bureau has grown out of a previously existing department of the Charity Organization Society of New York, which for two years had carried on a plan of investigating war activities and issuing approved lists. This war-time development is of especial interest in the field of charities on account of the pre-war development of opinion in favor of authoritative national endorsement of societies appealing for funds whose jurisdiction extends beyond the limits of given communities.

The Problem of Providing Workers.—The personnel phase of organized social work during the war came to be of dominant importance, as has been the case in regard to every other activity dependent upon human service. At one time serious consideration was given to the proposal that the U. S. Department of Labor through its division on professional employment should register and place persons available for professional social work. For foreign war-relief service, especially in France, and for manning the tremendous new projects of home organizations, such as the American Red Cross, the Young Men's Christian Association, the War Camp Community Service, etc., demands developed for trained workers in unprecedented numbers. The national organizations mentioned and others have created their own separate agencies for training new workers. But these organizations have had necessarily to depend upon the preexistent body of professional social workers as a main resource. Schools of civics and metropolitan universities have provided in the emergency short courses for persons going into war work. Members of the teaching and ministerial and other professions who have manifested interest in community problems have been sought for both paid and volunteer service. Councils of Defense in some states have undertaken to enroll and place these volunteer aids.

This increment of new workers is of the greatest significance for the future development of welfare activities. The possibilities of utilization of "volunteers" on a large scale, and the tendency that has developed at the same time for whole communities to become interested in projects of service (the "quota" idea) has not failed to command the attention of leaders in social work. With the discovery of this latent community patriotism has come a realization on the part of the new recruits that not patriotism and intelligence alone, but training and experience as well are required to make a success of the complexities of welfare activities in most communities. With the approaching end of the war must come another shifting of personnel. In Cleveland, for example, it is calculated that as many as 500 workers, trained or volunteer, have been detached from former connections with established social agencies. For them, and for a much greater number of new recruits, there arises in some cases the problem of demobilization, in others an opportunity for turning effort into new channels of service.

The American Red Cross.—Activities of the American Red Cross in the year 1918 extended into nearly all parts of the war zones of Europe and Asia and were led by the war into new fields of humanitarian effort at home. The War Council which had been appointed by President Wilson continued to be the executive body in control of all work as it had been during the preceding year. The members of this council were: Henry P. Davison, chairman; Cornelius N. Bliss, Jr.; John D. Ryan, Harvey D. Gibson, and George B. Case. William Howard Taft, chairman of the Central Committee, and Eliot Wadsworth, vice-chairman, were members *ex officio*.

The war work of the American Red Cross abroad may be briefly summarized as follows: In France appropriations of $47,783,985 were made to support canteen service, which had been in the war zone long before the first American troops reached there; equipment for hospitals maintained by the Red Cross or by the medical department of the Army, to whose work the Red Cross work was entirely supplementary; diet kitchens, hospital huts and convalescent homes for the wounded; rehabilitation of the maimed and disabled; food and shelter for a vast army of refugees; the rebuilding of devastated villages; and child-welfare work through clinics and nursing service. Work in Italy was begun at a time of great crisis in the military situation of that country. The appropriations of $16,964,048.40, which cover a period slightly longer than the calendar year, supported such activities as the housing and feeding of refugees; work among the civilian population, which did much to assure the soldiers through the help given their families that the American people were really with them in the war; canteens; employment projects for the destitute; health service and education; hospital and ambulance equipment and maintenance; and special welfare work for children. In England the appropriations of $10,820,250.62 for the period of the war were largely for the care of the shipwrecked, for hospital service, and for service to American men in hospitals and camps. Lines of communication were reëstablished between men and their families and comforts were provided for them in great quantities. From September, 1917, to June 30, 1918, the end of the fiscal year, the expenditures of the American Red Cross in Belgium had been almost one and a half million dollars. By the end of the year 1918 appropriations totaled $3,379,699. The work covered activities similar to those in other countries, including a great deal of relief work for children and the men in the Belgian Army. Active work in Switzerland did not begin until May, 1918. Appropriations for the remaining eight months of the year amounted to $1,972,233.75. Prior to this the Swiss Red Cross and the Swiss Government had received support for their refugee work amounting to $200,000. Stores were prepared in Switzerland in advance to take care of American prisoners whenever any might fall into the hands of the armies of the Central Powers. The other work in Switzerland was largely for the benefit of refugees and prisoners of the Allied nations. In Russia, Serbia, Rumania, Greece and Palestine, relief appropriations were made during the war of more than $18,000,000, the largest part of which came within the calendar year 1918.

The American Red Cross maintained also its Home Service (see *supra*) for the welfare of the families of soldiers and sailors, which extended sympathetic help to more than 300,000 families at a cost of $6,000,000. At an expense slightly greater than this sum it maintained 700 canteens along railway lines in this country and distributed very large quantities of comfort supplies, including more than 2,000,000 sweaters and 2,000,000 pairs of socks to men in camps and cantonments. The volunteer production of women and children in the chapter workrooms amounted to more than 290,000,000 articles for hospital, camp, and refugee-station use, including more than 250,000,000 surgical dressings. To aid the medical departments of the Army and Navy the Red Cross during the year 1918 enrolled for service more than 30,000 nurses and organized 50 base-hospital units. There were also 400 nurses in France who were serving the civilian populations in the name of the American Red Cross. Nursing service for public health in this country was maintained.

The organization of the American Red Cross grew during the year to a membership of 22,000,000 adults and 8,000,000 school children. The second war fund collected by popular subscription in June amounted to more than $175,000,000, although only $100,000,000 was asked for. The year was closed with a Christmas Roll Call for members, held during the week of Dec. 16-23.

During the year 1918 there were a number of disasters of great enough extent to need the aid of the American Red Cross, including the explosion of the munitions ship at Halifax and the earthquakes in Guatemala. Aside from these two major disasters there were four fires, three floods, seven heavy storms, one earthquake, and two explosions. The Halifax disaster (*A. Y. B.*, 1917, p. 90) resulting from the ramming of the French steamer *Mt. Blanc*, loaded with 2,600 tons of high explosives in Halifax harbor, Dec. 6, 1917, cost the lives of more than 1,000 persons. A large part of the city was devastated by the force of the explosion and the resulting fire, and 10,000 were made destitute. Serious injuries were suffered by 3,000 persons of whom 691 received some sort of injury to the eyes; forty-one were totally blinded. To the aid of these people the American Red Cross despatched a special train from New York loaded with supplies, and an entire base hospital with added personnel was sent from Boston. Additional blankets, window glass, and a staff of specialists in the surgery of the eye were sent from these cities and from Providence, Augusta, Bangor, and other nearby Red Cross chapters. The Red Cross office was maintained and assistance given in all plans for the relief of sufferers until Jan. 15, 1918. The earthquake in Guatemala was a series of tremors in the capital of that Central American republic beginning on Christmas Day, 1917, and continuing intermittently for a month. The President of Guatemala received a cable message when the first shock occurred expressing the desire of the American Red Cross to be of help if possible. On request a commission was sent from the United States to aid in organizing sanitary and other relief work, and several large shipments of supplies were sent by boat from New Orleans. The Red Cross commission remained on the scene until June, 1918.

RECREATION

HELEN P. MOORE

Recreation as a War Measure.—The organization of leisure-time activities has assumed a place of vital importance as a factor in winning the war. Organized recreation, which before the war had made for itself an important place as an essential force in civic life, has been employed during the war as an indispensable wartime measure in maintaining the morale of the troops in the home camps and in France. The Y. M. C. A., Knights of Columbus, Salvation Army and Jewish Welfare Board (see also XXVII, *Religion and Religious Organizations*) and the American Library Association (see also XXX, *Libraries*) have been providing, both in the home and foreign camps, leisure-time activities and athletics, games and recreation of various kinds, and have supplied for the men in service the only contacts possible in a military *régime* with normal social activities. All these agencies have been operating under the War Department and Navy Department Commissions on Training Camp Activities, which have taken further steps to provide wholesome recreation for the men in camps by sending into them song leaders, athletic and dramatic directors, and other specialists.

In the communities near the training camps the War Camp Community Service has been authorized by the War Department and Navy Department Commissions to undertake the organization of the social and recreational life of the communities for the benefit of the officers and soldiers and sailors in their free time. Home hospitality, the stimulation of lodges, fraternal orders, churches and private clubs in the interests of the entertainment of the men in service; the establishment in practically all the camp cities of soldiers' and sailors' clubs; the securing of the use of public and private baths, swimming pools, athletic fields, playgrounds and parks; the opening of schools as social centers; the arrangement of dances, musicals, community sings, socials, week-end parties and many other forms of entertainment and recreation; the prevention of overcharging of the men in service, the listing of available accommodations for visiting friends and relatives; the establishment of information bureaus, and the inauguration of a programme of work for girls along recreational, health and community-service lines, represent some of the manifold activities which have been carried through in an effort to give the men in training a substitute for their normal home lives.

The provision of clubs for men in service has been a particularly interesting phase of community hospitality and the provision of leisure-time activities. In some instances the clubs have been exclusively for the use of the men in service, but in a number of cases they have been practically community centers where civilians and soldiers come together and around which centers much of the social life of the town. The Camp Sherman Community at Chillicothe, Ohio, erected adjacent to the camp, is perhaps one of the best known of these community houses. The Community consists of a group of about eight buildings centering around the community house erected by the Red Cross. These buildings provide dormitory facilities and hostess houses, and minister in various ways to the comfort and enjoyment of the soldiers and their guests. The Red Cross, Y. W. C. A., Masons, Federation of Women's Clubs, Daughters of the American Revolution and a number of other organizations have pooled their resources to make possible this project, which represents an expenditure of about half a million dollars. Another interesting community house is the Camp Custer community house for civilians and soldiers given by the state of Michigan upon the investigation and findings of a governor's commission. About $250,000 has been invested in this splendidly equipped house. Manhattan and Junction City, Kans., also have community houses for the benefit of the men in service in the nearby camps and the citizens of the towns.

Out of the nation-wide effort which has been made to support the Government in its efforts to make the American army the cleanest in history, out of the successful experiment in war-time recreation conducted as a military and social necessity, has come an awakening of a community consciousness and community feeling which will persist long after the demobilization of troops has been completed and there is no longer a military necessity to be considered. The many phases of leisure-time activities which have been developed and strengthened through the war will persist as vital parts of community life.

Community Singing.—Of the many manifestations of this awakening of civic consciousness the development in community singing has been perhaps one of the most striking. A singing nation has kept pace with a singing army; there is probably no town whose people have not come together to sing the songs which the men in service have sung in the camps. Mass singing has been introduced during the year into motion-picture houses and cafés, and has played its part at dances and practically all places where people have come together. Through the efforts of War Camp Community Service, State Councils of Defense, and other national and local groups, liberty sings and community choruses and singing have multiplied. The national War Camp Community Service now has a Department of Community Singing through which organizers of community singing may be secured for the camp cities. An appreciation of home songs and of good music and the advancement of community solidarity are bound to come out of the almost miraculous development of community singing which has taken place in the United States during the year. (See also XXVIII, *Music.*)

Industrial Recreation. — Another very important development of the war has been the emphasis on the necessity for proper recreational activities for employees at plants engaged in war production as a vital factor in preventing labor turnover. Although industrial welfare work, with special emphasis on the provision of such recreational features as club houses, athletic fields, baseball diamonds, children's playgrounds and motion-picture shows, has been recognized for some years as one of the important fields of social service, it has never before assumed such importance as during the war, when the necessity for contented, 100 per cent. efficient workers has been of fundamental importance. A study of welfare work by the Bureau of Labor Statistics reported in January, 1918, states that of 431 establishments investigated, 168, with a total of 838,000 employees, were providing recreational facilities. Of the 168 plants, 40 per cent. maintained playgrounds. The statement has come from one large industrial plant that the company found it necessary to establish a playground in order to retain their men.

The Playground and Recreation Association of America, in response to a request from the Commission on Living Conditions of War Workers of the U. S. Department of Labor, established a department of War Workers' Community Service to be responsible for the development and conduct of social and recreational community service in war-production centers. This service will not duplicate any existing work nor will it undertake any specific work assigned to some other organization. It will, however, see to it that all existing facilities and opportunities for recreation in the community are made available for the workers. The impetus given industrial recreation during the war points to a very rapid development in the immediate future in industrial plants throughout the country.

Patriotic Play Week.—As an offset to the dangers of increased delinquency arising from war conditions and to the physical, mental and moral strain due to the abnormal conditions existing in war time, the Children's Bureau of the Department of Labor and the Woman's Committee of the Council of National Defense conducted a nation-wide war-time recreation drive culminating in Patriotic Play Week, celebrated throughout the country during the first week of September, 1918. An appeal was sent to 11,000,000 women in the state divisions of the Woman's Committee, asking them to promote in their own communities wholesome leisure-time activities during July and August, with special programmes arranged for Play Week. Patriotic Play Week accordingly became the goal towards which the playgrounds throughout the country worked during the summer. The celebration lasted in some communities during the entire week; in a few small communities it provided a novel and interesting feature of the county fair; in some of the larger communities an elaborate programme was carried out with special days devoted to water sports, to group games, to field and track events, and to pageants. Physical efficiency was stressed in most of the celebrations, and athletic tests and vigorous games were emphasized.

Community Houses. — The movement that has been started to erect community houses rather than monuments as memorials to soldiers who have given their lives for America is rapidly crystallizing, and a number of communities have already taken steps to establish such community recreation centers. The community houses established during the war in a number of camp cities such as Manhattan, Kans., as meeting places for civilians and men in service, will remain as community houses for the citizens. Plans are on foot for converting some of the soldiers' clubs in a number of the camp cities into community houses, in this way perpetuating the splendid community spirit which has grown up during the war, when all organizations and groups united to show the soldiers and sailors the nation's appreciation of their service.

Community Celebrations. — There has been a marked increase during the war in the number of community celebrations that have been held. America's patriotic holidays and those of the Allies have been marked by celebrations in which the community as a whole has participated. While Liberty Loan and Red Cross parades, community mass meetings and patriotic pageants have been arranged as war measures and for the sake of inspiring patriotism, they have contributed greatly to community life, and have given an impetus to a community action and feeling which will have permanent value and which will express itself in the months and years to come in civic celebrations.

Normal Recreational Activities.—As a result of war conditions and needs, as has been indicated, a number of phases of recreation have been greatly emphasized and important achievements brought about. Communities have been set to thinking along new lines, have been made to see the value for community life of activities primarily initiated for the soldiers. While the new conception of community recreation has been growing, normal play activities have made progress. During 1917, the first year of America's participation in the war, there was apparently little retrenchment and considerable growth in the recreation movement. Only seven cities, two of which were Canadian, out of the 1,260 sending reports of their playground and recreation work to the Playground and Recreation Association of America, reported that work had been discontinued because of the war, while 52 cities which had never before conducted playgrounds inaugurated the work. In all, 504 cities reported that they conducted playground and recreation-center work under leadership during the year 1917 at an expenditure of $6,659,600. In 148 cities evening recreation-center work was conducted in the schools.

Reports for 1918 indicate that during the second year of the war a larger number of cities discontinued their work as a war-economy measure. At the same time many cities continuing the work reported an increased interest and attendance, particularly on the part of adults at evening recreation centers. Attendance was decreased at some playgrounds because of the fact that many of the older children went into factories during the summer or worked on farms. Many of the activities carried on at the playgrounds naturally centered about the war. The plea for food conservation met a hearty response in canning clubs, domestic-science classes, and war gardens. First-aid classes, Junior Red Cross units, knitting and sewing for war relief reflected the desire of the children to be of definite service in the war crisis. Military drills, hiking, and athletic games and contests became important factors in the effort to make the children of the country physically fit.

A very interesting development in the recreational life of an individual community took place in the devastated district of Halifax, N. S., where over 1,000 families were made homeless in December, 1917. A number of playgrounds were opened in this district with an increased attendance over preceding seasons of 300 per cent. So important was the work felt to be as a reconstruction measure that the Massachusetts Halifax Relief Commission appropriated $4,000 for playground apparatus. A considerable amount also was expended for leadership.

Effect of Daylight Saving on Recreation.—The effect of daylight saving on recreation has been very beneficial, as it has stimulated athletic activities, gardening, and the use of playgrounds by adults during the longer hours of daylight at their disposal after the day's work. In a number of towns twilight or sunset baseball leagues were organized with teams composed of men from factories and business and professional offices. War gardening as a part of the food-conservation campaign has been among the beneficiaries of daylight saving. The estimated proceeds of the year's war-garden crop shows an increase of over 50 per cent. over 1917's crop (see also XVI, *Agricul-*

ture, and *Horticulture*). This increase has been attributed by the president of the National War Garden Commission to daylight saving. Very direct physical benefit in the shape of invigorating and healthful exercise has accrued to the war gardeners.

Compulsory Physical Training.—The last three years have seen an appreciable growth in the provision for physical training in the schools. The reason for this is found to a great degree in the war. The world has awakened to the fact that its greatest resource is human power and that to make this human power most effective it must be as nearly perfect as possible. The percentage of young men in America who were rejected for military service under the draft law because of physical incapacity has appalled the nation and aroused it to the realization that men and women must be made physically fit in childhood if they are to be physically fit when mature. England and France, it is said, have decided to make physical education a part of their national educational programmes. Seven states of the Union, New York, New Jersey, Nevada, Rhode Island, California, Maryland and Delaware, have passed laws since May 15, 1916, requiring physical training in the schools. At the 1918 session of the New York legislature the sum of $60,000 was appropriated to enable the State Department of Education to provide for the supervision and instruction in physical training of teachers who are required to teach physical training. The programme of physical training laid down in the syllabus prepared by the Board of Regents and the Military Training Commission of the state provides for medical inspection, recitations in hygiene, and physical exercises including gymnastics, elementary marching, and organized, supervised play, recreation and athletics. The programme requires six hours a week to be devoted to physical training by each pupil. Maryland and Delaware have passed laws during 1918 making physical education compulsory. The Maryland law requires that at least 15 minutes a day shall be devoted to physical training and at least one hour each week shall be given to dramatic play outside of the regular classroom work in all elementary schools. Public high schools are required to have one hour a week of physical training and two hours of directed play or athletics outside the regular classroom work. The Delaware law creates a Physical Training Commission which is responsible for planning a system of physical training and instituting it in the schools of the state subject to the direction of the State Board of Education. A number of other states, such as Massachusetts, Connecticut, Pennsylvania, Ohio and Colorado, have made efforts to have compulsory physical education laws passed, and the growth of public opinion is such that within a few years it is possible that physical training will be required universally in American schools.

CHILD WELFARE

Laura A. Thompson

The Children's Year.—The most striking feature of the year in child welfare was the nation-wide celebration of "Children's Year." Partly as an extension of the Baby Week of the two previous years (*A. Y. B.*, 1916, p. 390; 1917, p. 376), but more definitely as a war programme, the Federal Children's Bureau and the Child Welfare Department of the Woman's Committee of the Council of National Defense began early in 1918 a vigorous campaign to make the second year of the war one of united activity in behalf of children. The immediate goal was the saving of 100,000 of the babies who are sacrificed yearly to preventable diseases. Each state was challenged to save its quota, and to carry on the campaign all over the United States local child-welfare committees were appointed in coöperation with the State Councils of Defense. The drive began on April 6, the anniversary of America's entrance into the war, with a nation-wide measuring and weighing of babies and children of pre-school age. The high percentage of men rejected in the draft for physical causes, many of which started in some slight remediable defect in childhood, had revealed in a startling way the need for preventive work in the early years of life. Since weight and height are a rough index of the health of growing children, the weighing and measuring test served two purposes: it showed individual parents that the physical condition of their children required special attention, and it made plain to communities the need for definite public provision for the health of young children.

Wherever possible the weighing and measuring was done at infant consultation centers, with doctors and nurses in attendance, but where this could not be arranged, individual mothers were urged to fill out the record cards which were supplied by the Children's Bureau. These had printed on them a table showing average heights and weights of children at different age periods, with directions for making the tests. In all, about seven million cards were distributed, and by December records for nearly a million and a half children had been received by the Children's Bureau. In California, where 40,000 records were tabulated, 47 per cent. of the children were shown to have some remediable defect; 31 per cent. to have abnormal tonsils or adenoids; and 29 per cent. to be below the average in height or weight. From other places also came reports of a high percentage of defects which needed attention. As a result of the interest aroused a large number of new infant-welfare centers have been established, public-health nursing has been extended, and better provision made in a number of cities and towns for the treatment of children requiring medical attention. In Minnesota the new child-welfare department in the State Board of Health has instituted a state-wide investigation of pasteurization plants and has planned to send a public-health nurse to give demonstrations of the proper care of children throughout the state. Michigan has its "baby special" doing similar work, while in Massachusetts centers of child conservation have been established in more than 40 cities and towns. Other states also have developed follow-up programmes that the benefits of the campaign may be permanent.

The weighing and measuring test was followed in the summer by a recreation drive and Patriotic Play Week for the purpose of securing a review of what each community was doing to provide safe and healthful recreation for children and young people, with particular reference to the need of guarding them against the difficult problems of delinquency which come in war time (see also *Recreation*, *supra*, and *Criminology*, and *Penology*, *infra*). This was followed in the fall by a back-to-school drive, which had for its object, in President Wilson's words, "that no child may have less opportunity for education because of the war." Two things were attempted by the drive: to return to the schools and keep there the children who have deserted them for industry, and to keep the children now in school from leaving prematurely. Where family need was the cause of leaving, local committees were urged to provide a system of scholarships. In connection with the campaign the Federal Children's Bureau issued a series of Children's Year leaflets with outlines and programmes on the different lines of work suggested. It published also the first part of a bulletin on "Child Care," this section covering the preschool age.

Maternal and Infant Welfare.—A bill for the public protection of maternity and infancy which has the backing of the General Federation of Women's Clubs and the Children's Bureau was introduced into Congress on June 27. It provides for an annual Federal appropriation to each state that makes equal appropriation for the maintenance of its provisions. These embrace the creation of a state board of maternity aid and infant hygiene, which is directed to provide instruction in those subjects through public-health nursing, consultation centers, and other suitable methods. The board would also provide medical and nursing care for mothers and infants at home or at a hospital when necessary, especially in remote areas. How great the need is for better provision for the care of babies and mothers in rural regions was emphasized in the Children's Bureau report on "Maternity and Infant Care in a Rural County in Kansas," which was published during the year. This report, which is the first of a series on rural conditions, was based on the study of a county in Kansas where the level of prosperity was high, no home more than 20 miles from a doctor, telephones abundant, and roads good. Yet two-thirds of the mothers had no medical care before their children were born; more than a third had no visit from a physician after the child was born, and four-fifths of the women, farmers' wives, had to work for large farm crews until very near the time of confinement. The report particularly stressed the need of establishing a public nursing service for mothers and children that would reach to the rural parts of a county.

Another part of the Bureau's inquiry into the causes of infant mortality in cities was published in 1918. This covered Waterbury, Conn., where the field work was done in the first half of 1915 when Waterbury was already becoming a war-industries town. The statistics show much the same relation between family income and infant mortality revealed in the earlier reports (*A. Y. B.*, 1917, p. 376) as well as the bad effects on infant life of crowded housing conditions and poor sanitation. "Birth Statistics in the Registration Area of the United States: 1916," published by the Bureau of the Census in October, showed an infant-mortality rate for the registration area of 101 as against 100 in 1915; the state rates ranged from 70 in Minnesota to 121 in Maryland (where the death rate among colored babies is high), and the city rates from 68 in St. Paul, Minn., to 173 in Fall River, Mass.

Child Health.—Early in the year a group of specialists in children's diseases in the New York Academy of Medicine organized themselves as a committee on war-time problems of childhood. This was expanded later into a committee national in scope, made up of both lay and medical members, called the Child Health Organization, with Dr. L. Emmett Holt as chairman and Owen R. Lovejoy as secretary. The association has announced as its two main objects to secure adequate health examination of all children in the public schools and to consider the problem of malnutrition among school children. Studies made by the New York City Bureau of Child Hygiene of the health and nutrition conditions of the children attending the public schools in certain districts of New York showed that at least one-third of the children were so much below the normal standard of growth as to call for special nutritional care. At least a third of these required medical attention. Several nutrition clinics have already been established in connection with the Bellevue and other hospitals and dispensaries and the city Board of Education is asking for an appropriation of $50,000 to extend the work of school lunches in 1919.

The increased cost of milk and its effect on the feeding of young children mentioned in last year's review (*A. Y. B.*, 1917, p. 375) led to investigations by the Federal Children's Bureau in several cities. The report for Baltimore showed that of the 756 children between two and seven years of age covered by the study, only 29 per cent. were having fresh milk to drink as against 60 per cent. a year ago, and that less than three per cent. of the children were having as much as three cups a day. In Washington, D. C., out of 482 children between two and seven years of age more than half were getting no fresh milk at all. In order to bring about better general understanding of the nutritional needs of young children, the Children's Bureau gave wide distribution to a bulletin entitled, "Milk, the Indispensable Food for Children." (See also XVI, *Dairying.*)

State Commissions and Surveys.—By appointment of the governor, Missouri has again a Children's Code Commission with Judge R. E. Cave of St. Louis as chairman. A number of the bills proposed by the former commission failed of passage in 1917.

The new commission is to prepare these for re-introduction into the legislature of 1919 with such revisions as seem necessary. A Child Welfare Commission has been organized also in New Hampshire, with Mrs. F. S. Streeter of Concord as chairman. As a preliminary to undertaking the codification of the laws affecting children in Oklahoma, a state-wide survey of child-welfare conditions in that state was made for the University of Oklahoma by the National Child Labor Committee. The report covers the fields of public health, recreation, education, child labor, agriculture, juvenile courts and probation, the institutional care of children, together with home finding, and poor relief. Three state social surveys made by the Russell Sage Foundation at the instance of State Councils of Defense are of interest to child welfare. The first, covering West Virginia, was published late in 1917; those on Florida and South Carolina appeared early in 1918. The Florida report recommended the establishment of an unpaid advisory board of charities or public welfare with a competent secretary; that for South Carolina, among other recommendations in regard to child welfare, urged the extension of the placing-out method of caring for dependent children.

Dependent Children. — One more state was added during the year to the list of states, now numbering 36, that have adopted some form of "mothers' pension" law. The new Virginia act authorizes the county board of supervisors or city council to pay to widows with children under 16 years not more than $12 a month for one child, $18 for two children, and $4 for each additional dependent child, provided the mother has been a resident of the state for three years and of the county or city two years. A bill with a similar purpose applying to the District of Columbia, which has the support of all the child-welfare organizations in Washington, was introduced in Congress on May 8. It gives to the Board of Children's Guardians power to grant allowances to mothers of children under 16 dependent upon them for support. At present the Board can pay for the support of such children only when they have been removed from their homes. In an act creating the State Board of Charities and Correction with a state commissioner as its chief executive officer, New Jersey provided for a unified control of all the charitable and correctional work of the state, including the placing-out of dependent children formerly done independently by the State Board of Children's Guardians. Four acts were passed relating to parental responsibility for support. Virginia made desertion of wife or children a misdemeanor; Kentucky provided for a supervisor of parents charged with wilful desertion and abandonment of indigent children under 16 for Jefferson County, in which Louisville is located; Massachusetts provided that in illegitimacy proceedings bail forfeited can be applied to the support of the child, and New York that a person adjudged father of a bastard child may be placed on probation for such time as the court may direct during the life of the order of filiation.

With the change of administration in New York City a great step backward was taken in the work of caring for the child wards of the city in the practical giving up of the placing-out work of the Children's Home Bureau and the swinging back to the old system of institutional care. In contrast to this is the action of Delaware, which is steadily building up new and better standards of caring for its dependent, delinquent and defective children. Among the investigations of the year should be mentioned the survey made by the Russell Sage Foundation for the newly organized Children's Bureau of Delaware of the state's present care of its children in order that an intelligent programme might be worked out for the provision to be made for the future.

Defective Children.—In spite of the pressure of war problems several state legislatures gave attention to the needs of defective children. Virginia appropriated $10,000 a year for two years to the State Board of Health to establish a hospital for the treatment of crippled and deformed children, while New Jersey passed a law providing that whenever a board of education of any school district establishes a class for crippled children, the county superintendent of schools shall apportion $500 for each teacher employed for such class or classes. New Jersey provided also for the establishment of special classes in any school district where there are 10 or more blind or deaf children not being cared for; Kentucky for the compulsory education of deaf children between seven and 16 years of age; and Maryland for increasing the compulsory school attendance limit for blind or deaf children from 16 to 18 years. State training schools for the feeble-minded were established in South Carolina. and a farm colony and training school in Kentucky. New York directed its new State Commission on the Feeble-Minded to make a state census of the feeble-minded, provide accommodations for such as require care and treatment, establish farm and industrial colonies, and administer the law for the care and treatment of the feeble-minded.

Juvenile Courts.—An investigation of great importance to the welfare of children was begun by the Federal Children's Bureau in its nation-wide inquiry into the operation of juvenile courts and closely allied agencies. This study, in which the committee on juvenile-court standards of the National Probation Association is cooperating, will probably extend over two or three years. The Bureau expects to publish the results in a series of pamphlets covering the most important aspects of the work of children's courts in the United States. It issued late in the fall a report on "Juvenile Delinquency in Rural New York," giving the results of a field study of 21 typical country communities made under the direction of the New York School of Philanthropy. The report presents in narrative form some of the causes which make for child wrongdoing in small communities, and points the way to the better safeguarding of child life in rural regions. Recreational needs are particularly stressed and the elimination of the justice of the peace as a judge of children's cases is urged, with the establishment in their stead of a system of county juvenile courts covering all counties of the state.

Few statutory changes affecting delinquent children were made, but among these should be mentioned the act establishing a state industrial school for girls in South Carolina, the need for which has long been felt. Louisiana passed a contributory-delinquency act and provided for a commission to study the training and reformatory system of the state. Texas extended its contributory-delinquency act to include all children under 17 years of age, and passed a law establishing procedure in cases of delinquent boys and girls to meet the difficulties which had arisen from certain sections of previous enactments having been declared inoperative. In the appointment of Miss Kathryn Sellers as judge of the juvenile court of the District of Columbia, Washington claims the distinction of being the first city in the United States to have a woman on its juvenile-court bench judge.

Child Labor.—A great set-back was given the movement to control child labor when the Supreme Court of the United States by a five to four decision declared the Federal Child Labor Act unconstitutional on June 3. Under the Child Labor Division of the Children's Bureau a well organized system of administration had been developed, and the enforcement of the law, which had been in operation since September 1, 1917, had been accomplished with a negligible disturbance within the establishments affected. Both opinions of the court admitted the need of limitations upon the right to employ children in the interest of their own and the public welfare, and several bills have been introduced into Congress designed to effect this in a manner not repugnant to the Constitution. One which has the approval of practically all the promoters of the old law has been introduced into the Senate as an amendment to the War Revenue bill which was still pending at the close of the year. It invokes the taxing power instead of the interstate-commerce power, but the standards set are the same as those of the old child-labor law. (See also XV, *Labor.*)

SOCIAL HYGIENE

WALTER CLARKE

Protection of Soldiers and Sailors.—Only in the light of the years of careful public education is the phenomenal growth of the social hygiene movement in the United States during the year 1918 understandable. For several years prior to the entrance of the United States into the war the problems of venereal disease and the methods for the solution of these problems had been presented to the American public by the American Social Hygiene Association and a number of local affiliated organizations. In practically every city of the United States the interest of the leaders of public opinion had been enlisted in the repression of prostitution and the control of venereal diseases. When the nation was plunged into war, this quiet, painstaking campaign of education immediately bore fruit. There was in practically every city a group of leaders who immediately grasped the importance of a comprehensive Government social-hygiene programme to meet war conditions. When such a programme was formulated in terms of general policy by the Council of National Defense, there was an immediate response throughout the United States. Local government agencies and private organizations took up the lines of action indicated by the Government, developed the necessary leadership, and applied the accepted scientific methods.

The first, and perhaps the most conspicuous, move made by the Government was the closing of the segregated districts and of all vicious resorts in the vicinity of all military and naval camps. This work was done by the War Department Commission on Training Camp Activities, which was created by the Secretary of War for the purpose of looking after the extra-military interests of soldiers. Subsequently an identical Commission was created by the Secretary of the Navy, both Commissions being under the chairmanship of Raymond B. Fosdick. The repression of prostitution and the illegal sale of intoxicating drinks became a nation-wide movement, vigorously pressed by the Commissions on Training Camp Activities. In a short time all segregated districts and notorious disorderly resorts within five miles of every military establishment in which soldiers were in training were closed. Since the beginnings of this work a law-enforcement department has been developed in the Commissions on Training Camp Activities, the personnel of which is, for the most part, furnished by the Surgeon-General of the Army, officers of the Sanitary Corps being stationed in the zones near all important military establishments.

Education in Social Hygiene.—The need of social-hygiene educational work was apparent from the beginning of mobilization. Certain organizations, particularly the American Social Hygiene Association and the Young Men's Christian Association, began this work in an experimental way, but it soon became evident that a programme must be worked out by some branch of the Government for instructing soldiers and sailors. At the suggestion of the Surgeon-General of the Army a special division of the War Department Commission on Training Camp Activities was established for instructing soldiers in the nature and prevention of venereal disease. Shortly thereafter the work was extended by the Navy Department Commission to include sailors. An elaborate programme is now being carried on with ample facilities provided by the Commissions on Training Camp Activities and with personnel provided by the Surgeons-General of the Army and the Navy. In every important army camp a non-commissioned officer, specially trained for social hygiene educational work, is stationed. Field Representatives of the War and Navy Departments Commissions assist medical officers in carrying on the social-hygiene educational programme. More than two million and one half men have been reached through the lecture service; more than five million pamphlets have been placed in the hands of soldiers and sailors. Other facilities have been provided in proportion. It is intended that no man shall be able to plead ignorance as a reason for venereal infection.

Early in the progress of the war it was seen that some special agency was needed for arousing civilian sentiment to grapple with its responsibilities for the health and morals of soldiers and sailors. A special committee was appointed by the Council of National Defense, which was known as the Committee on Civilian Coöperation for Combating Venereal Diseases. This committee conducted a vigorous publicity campaign, directed especially toward the leading business and professional men of towns and cities within 100 miles of army establishments. The Committee urged these men to assume responsibility for the moral and health conditions existing in the communities in which they lived. They were asked to coöperate with the Government in repressing prostitution and controlling venereal disease. The Committee was at length taken over by the Commissions on Training Camp Activities and became one of the units of the Commissions. Its work has been vigorously extended to include the presentation, to employers of labor, of the menace to industrial efficiency which is involved in venereal disease. The response to this line of propaganda was most satisfactory. A similar campaign of education is carried on among the women of the nation by another section of the Commissions, for the purpose of enlisting their interest and support in dealing with the problems of social hygiene.

Protection of Women.—Among the women in the vicinity of army camps who need special protection are many girls who become delinquent, and are in danger of becoming criminal, under the pressure of war-time excitement and social disruption. Recognizing this need, the Commissions on Training Camp Activities established a service for the protection of girls and young women from moral breakdown. This branch of the Commissions grew rapidly, and its agents are now engaged in protective work in all cities near which are located large military establishments. The work of law-enforcement officers and the girls' protective officers in the vicinity of camps soon brought to light the fact that facilities for the care of delinquent and criminal women were far from adequate. A careful study has been made of these facilities and a branch of the Commissions has been established for the assistance of city and state governments in providing adequate facilities.

Government Campaign against Venereal Diseases.—Perhaps the most outstanding development of the year has been the passage of a bill known as the Chamberlain-Kahn Act appropriating about four million dollars for social-hygiene work, establishing a Division of Venereal Disease in the U. S. Public Health Service, and an Interdepartmental Social Hygiene Board, of which the Secretaries of War, the Navy, and the Treasury are members. The Division of Venereal Disease has already begun its work upon a comprehensive programme of public-health and educational work. At this writing the Interdepartmental Social Hygiene Board has organized and has planned its activities, which are to include, in accordance with the terms of the Act, research into the medical, social and educational aspects of social hygiene, and a general advisory relationship to the various branches of the Government which are engaged in the campaign against vice and venereal disease. (See also XXV, *Public Health.*)

Activities of Private Organizations.—The activities of numerous private organizations cannot be described in this *résumé.* Especially significant, however, is the work of the American Social Hygiene Association in connection with the Commissions on Training Camp Activities and the excellent educational work of the Young Men's Christian Association and the Young Women's Christian Association. Numerous other organizations, such as the Red League, the Committee of Fifteen, of Chicago, and the Committee of Fourteen of New York City, have carried on vigorous social hygiene work.

Probably the coming year will see even more important developments in the work of city and state health departments along the lines of social hygiene than has developed during 1918. Numerous states have adopted *in toto* the social-hygiene programme of the Government and a number of states have created special bureaus of venereal disease. Judging from all indications, the campaign against venereal disease has now assumed permanent national scope and can be counted upon to produce excellent results.

CRIMINOLOGY AND PENOLOGY

EDWARD R. CASS

General Survey.—The present period in American penology and criminology presents many encouraging features. State legislatures are seemingly more interested and generally progressive. Notwithstanding the absorption of the public mind in the problems of the war, the interest of the general public in prison reform continues unabated. The executives of many correctional institutions show zeal in pioneering and in emulation of each other in the working out of new methods. The indispensable factor in "correction," namely, the wardens and superintendents, the chaplains, the physicians, the psychologists and psychiatrists, as well as the members of boards of inspection and control and those connected with prison-reform associations are "getting together." This is excellent and timely as the harbinger of a new era in the American attitude toward crime and the delinquent. There is indeed need for steady development and improvement to eliminate the many shortcomings of the system which stands as a monument of society's neglect and apathy. Briefly, some of these are the following: the unspeakable county-jail system with the fee plan of compensating sheriffs; unhealthful living conditions for prisoners; inadequate employment systems; lack of scientific classification and differentiated treatment of prisoners; absence of adequate educational programme for inmates: legalistic criminal procedure; inadequate parole and probation methods; the lack in most states of a control of state correctional institutions; the persistence of politics as a factor in prison management; and finally and most pervasive of all, a crushing system of repressive discipline.

Evil conditions due to mismanagement are continually revealed. A special committee appointed by the mayor of Detroit reported deplorable conditions at the Detroit House of Correction. Poor food, bad sanitation, filth and vermin, and the rigorous enforcement of "silence" as a part of the daily routine are some of the evil conditions reported by the investigators. A grand jury in North Carolina recommended that the commitment of prisoners to a convict camp be discontinued because of unhealthful living conditions. The Massachusetts Bureau of Prisons in its report on the state prison at Charlestown pronounced it the worst in the United States, and characterized the existing conditions as being as abominable in some respects as those against which the wrath of Paris was directed in 1789. In Alabama the lease system of convict labor continues to flourish. Minor changes have been made, but the offender is still traded for dollars and cents with little or no regard for his welfare. Texas and Florida continue in the same backward condition.

In many sections of the country the populations of penal institutions have decreased surprisingly. The Director of Prisons in Massachusetts considered seriously the closing of several institutions of that state. In August the total number in all the prisons of Massachusetts was 5,239, the smallest in the last 40 years. Nevertheless, the number of arrests was the largest in the history of the state. The courts have inclined toward leniency and have employed the suspended sentence and probation more freely than in any preceding period. Pennsylvania reports a decrease of about 40 per cent. in its prison population. On the other hand, because of the crowded condition of the Federal Prison at Atlanta, the United States Attorney-General issued an order designating the Maryland state penitentiary at Baltimore as a place of detention for Federal prisoners sentenced from that district. The jails, penitentiaries and reformatories in New York State have experienced a decided falling off, and the state prisons also have shown a decrease. Omaha, Neb., closed its workhouse. The reason for these conditions is explained by the increased opportunities for employment resulting from the war, to the more liberal use of the probation system, and to the spread of prohibition.

At the end of the first year of our participation in the war it was evident in many sections that juvenile delinquency was on the increase. The New York Probation Commission finds that the number of young girls placed on probation from the courts of the state began to increase soon after war was declared, and the number has remained abnormally large ever since. Probation officers have been busy dealing with "girl and soldier" cases. The statement has been made by the chief probation officers of the Court of Domestic Relations of Hamilton County, Ohio, which contains Cincinnati, that juvenile delinquency had increased 21 per cent. since the beginning of the war. From Chicago comes similar information; in one month the number of petitions filed for delinquent children in the Juvenile Court of Cook County was 54 per cent. greater than during the same month in 1916. The annual report of the Children's Court of New York City shows that 14,519 children came before the Court in 1917, an increase of 2,094 over the preceding year. The experience of other countries at war has been similar, and in some countries the importance of the problem was not recognized early enough.

Criminology.—The year has had no startling disclosures in the study of crime. As usual numerous articles and periodicals appeared and the reports of various studies made both inside and outside of institutions were published. The following is taken from a recent Elmira Reformatory publication. The study is of interest and sadly indicative of a serious problem far from solution:

For about two years there has been in operation under Dr. Harding, the senior physician, a psychological laboratory, which has made an intensive study of 400 consecutive admissions, young men between 16 and 30 years of age. Though the Reformatory is commonly spoken of as for first offenders, 46 per cent. acknowledged that they had previously been sent to other institutions, and an additional 19 per cent. admitted having received suspended sentence or probation.

Of the 400 cases, only 42 per cent. were regarded as normal human beings. Of the 167 "normals", only 16 were of "good" intellectual capacity, 64 were of fair capacity, and 87, or about half, were "dull or poor". Even of the 16 "good" ones five were alcoholics, and 51 of the others were either alcoholics or drug addicts.

Those who have indulged to excess in drink and drugs may do well in a place where they cannot get them, but there is always a danger, if not probability, of their returning to them outside, in which case all their attainments may go for naught.

About 58 per cent. of the Reformatory population is considered "subnormal", through defects of various kinds. Eleven of the 400 cases were insane. The committable insane shade into another class, the "psychopaths", some of whom will eventually go to asylums. Some it will never be entirely safe to have at large. This class contains many of the most dangerous and hopeless criminals. "At best they are so different from other people that they are almost certain to be misfits wherever they attempt to establish themselves in the industrial world."

Of the 400 cases, 44 suffered from epilepsy, which at times renders them not fully responsible for what they do. Dr. Harding classifies 57 others as either imbeciles or morons—popularly known as feeble-minded, adults with a mental development not exceeding that of the average child of 12 years. "They have reached their limit, and must go through life with this poor equipment."

Other defectives, classed as "recidivists" or repeaters, number 42. "They are those not otherwise classified, who have previously served several terms for similar offenses without any profit from correctional influences, and who give little or no promise of improvement under the Reformatory's care. Many of them are of a class sometimes called 'congenital criminals'."

Dr. Harding is of the opinion that about 25 per cent. of the defective classes, or about 17 per cent. of the entire Reformatory population should have permanent custodial care.

The annual report of the Board of Managers for 1917, commenting on Dr. Harding's findings, says: "What should be done with this three-quarters of subnormals or abnormals, who constitute so large a part of our population, and for whom there is now no special provision? We frankly confess that, beyond what we are already doing, our ideas are not well defined. We do not feel that we are as yet sufficiently well informed. What would be suitable for morons might be all wrong for the epileptic; and the psychopaths are much harder to provide for than any of the others."

The psychiatric work at Sing Sing Prison under the able supervision of Dr. Glueck, who has gone into the military service of the Government, is at a standstill. A committee of the New York State Prison Commission conducted hearings in an investigation of the treatment of mentally defective delinquents. It is intended to submit a definite programme for mental examinations and custodial treatment to the next legislature. The growing demand for court psychiatric work is a decidedly progressive tendency.

Courts, Probation and Parole.—Those interested in probation are protesting against the use of the system for drug addicts. Such cases, it is felt, are proper ones for hospital treatment. Rural delinquency and neglect is as yet largely an unsolved problem of no little importance (see also *Child Welfare, supra*). The need to establish adequate courts and obtain well trained probation officers seems imperative. Preventive agencies in rural districts are greatly needed. There is little improvement in the unfortunate conditions resulting from the lack of uniform and higher standards of supervision of those on probation. A centralized parole direction is provided for under the new Illinois law. The superintendent of pardons and parole has as his advisers an assistant director, a superintendent of prisons, and a state criminologist who is a well known psychiatrist. The present system of pardoning a prisoner in Pennsylvania puts no restrictions upon his conduct after pardon. Legislation is contemplated to change this so as to provide for the revocation of a pardon for improper behavior. The perfunctory system of paroling New York State prisoners still prevails. Approximately 90 per cent. of those paroled are released at the expiration of their minimum terms. The parole board is hardly necessary to this procedure. From everywhere comes the complaint that probation and parole work is handicapped because of inadequate numbers of supervising officers. A recent report of the public defender's work for Los Angeles County, California, contains much enlightening material. Pleas of guilty were entered in 66 per cent. of the cases, while attorneys in private practice entered pleas of guilty in only 39 per cent. Only 16 per cent. of the public defender's cases went to trial, while 25 per cent. of the cases in which private counsel appeared went to trial. Verdicts of not guilty were returned in 37 per cent. of the cases represented by the public defender, while similar verdicts were returned in only 25 per cent. of the cases handled by private attorneys. The average time occupied by the public defender in trying cases was a little less than one-half of the time required by private attorneys. By avoiding the necessity for trials and by trying cases in half the time required by private attorneys, the public defender has saved a considerable sum to the taxpayers. The following is a comparison of the public defender's work with that of appointed attorneys:

Disposal of Cases	Appointed Attorneys	Public Defender, 1916-17
Pleas of guilty: number	115	303
Per cent.	61.7	66.6
Cases in which probation was granted: number	31	92
Per cent.	27.8	30.3
Trials: number	30	51
Per cent.	26	16.8
Verdicts of not guilty or disagreements: number	6	22
Per cent.	20	43.1

The Voluntary Defenders Committee which is working out the idea of the public defender in some of the New York City courts reports that during the first nine months of its existence there were handled 553 cases. Of this number 484 were cases in trial courts, and all but 38 of these were felonies. Of the 484 court cases handled, 48, or 10 per cent., resulted in trials. There were 22 convictions, 24 acquittals, and two disagreements. The larger part of the work apparently consisted in advising clients relative to pleas, investigating cases, and presenting constructive suggestions and plans for defendants to the court. Success seems to have crowned the work of the public defender in the Criminal Superior Court in Connecticut. The office has been permanently designated by law.

Capital Punishment.—The following statistics of legal executions in the registration area for deaths in 1917 are supplied by the U. S. Census Bureau:

	Total	Electrocution		Hanging	
		White	Col.	White	Col.
Registra. area[1]..	64[3]	18	17	9	19
Ala.[2]....	1	..	..	..	1
Cal.....	2	..	..	1	1
Conn....	5	..	..	5	..
Dist.of C.	1	..	..	..	1
Ga.[2].....	2	..	..	..	2
Hawaii..	5	..	..	..	5
Ky	1	..	1	..	..
La.[2].....	6	..	..	2	4
Mass....	1	1	..	..	..
Miss.[2]...	2	..	..	1	1
Mont....	3	..	..	..	3
N. Y....	6	6	..	..	..
N. J.....	4	4	..	..	..
N. C....	4	1	3	..	..
Ohio....	3	2	1	..	..
Pa......	11	4	7	..	..
S. C.....	1[3]	..	..	..	..
Va......	5	..	5	..	..
Wash...	1	..	..	..	1

[1] Includes 28 of the 48 States, Hawaii, the District of Columbia, and 42 cities in non-registration states.

[2] Entire state not included in the registration area; only certain cities.

[3] One execution in South Carolina of a colored person, but manner not specified.

The pardoning of Charles Stielow by Governor Whitman of New York has tended to shake the confidence held in capital punishment by those who oppose the abolition of the death penalty. By a hair this man of misfortune was saved from electrocution through several reprieves. If it had not been for the interest of outsiders, it is a question whether official action would have been sufficiently aroused to instigate the numerous hearings and investigations. Without all of this an innocent man would have been forced to give his life. Such impressive instances of apparent or proven miscarriage of justice occur perhaps more frequently than is realized. From Akron, Ohio, comes the report of the electrocution of a man while a reprieve was in transit. The deterrent theory of the death penalty is believed in far less than even a half-decade ago. What unsettles many of the adherents of the death penalty and makes them loath to concede the desirability of the abolition of capital punishment is the lack of an adequate substitute. They fear the absence of impersonal integrity of governors or parole boards of the future.

Lynchings.—The number of lynchings for the year 1918 totalled 62, an excess of 24 over the year 1917. Of the total number lynched, 58 were negroes and four were whites. Five of those put to death were women; 16, or a little more than one-quarter of those put to death, were charged with rape or attempted rape. These totals, together with the analysis presented below, were supplied by the Division of Records and Research of Tuskegee Institute.

The offenses charged were:

WHITES:	
Murder	2
Being disloyal	2
NEGROES:	
Alleged complicity in murder	14
Murder	7
Threats to kill	6
Rape	10
Attempted rape	6
Alleged participation in fight about alleged hog stealing	3
Being intimate with woman	1
Assisting man charged with murder to escape	1
Robbing house and frightening women	1
Killing man in dispute about automobile repairs	1
Making unwise remarks	1
Killing officer of the law	2
Killing landlord in dispute over a farm contract	1
Assault with intent to murder	1
Wounding another	1
Robbery and resisting arrest	1
Making unruly remarks	1

The states in which lynchings occurred and the number in each state were as follows:

Alabama	3	Mississippi	6
Arkansas	2	North Carolina	2
Florida	2	Oklahoma	1
Georgia	18	South Carolina	1
California	1	Tennessee	4
Kentucky	1	Texas	9
Illinois	1	Virginia	1
Louisiana	9	Wyoming	1

Prisoners and the War.—At its tenth annual session the American

Institute of Criminal Law and Criminology adopted a resolution calling upon governors of all states to parole inmates of penal institutions, whereever this is practicable, for work on farms, in mines, on roads and in essential war industries. There was a growing agitation for the utilization in some way of prisoners and prison labor in the prosecution of the war. A bill introduced in the Senate by Mr. Smith of Georgia, providing for the employment with compensation of inmates of all or any penal institutions on work rendered necessary or required by the military exigencies, was not passed. It is stated that the bill had the approval of the American Federation of Labor, the War Department, the Navy Department, the War Industries Board, the War Labor Policies Board, and the President. The President issued an order permitting the placing of war-supply contracts with state prisons and reformatories, and directed that the prisoners engaged in work on such contracts should be paid the same wages as those received by other skilled workers. This was a step in the right direction, but there is danger of conflict with the provisions of state constitutions and laws. There has been a marked increase in the effort to employ prisoners on roads and farms, at manufacturing and automobile license-plate making. Farm work appears to be a popular form of employment for prison inmates. The following, which is a partial list, indicates to what extent this activity is engaged in:

	Acres		Acres
Alabama.....	4,400	Mississippi....	40,000
Arkansas.....	10,000	New York....	1,100
Colorado.....	25	N. Carolina...	6,000
Delaware.....	1,000	Pennsylvania..	5,262
Dist. of Col...	2,650	Ohio.........	1,500
Georgia......	2,293	Oklahoma.....	2,000
Illinois.......	2,200	S. Carolina....	5,000
Indiana......	1,600	S. Dakota....	580
Louisiana.....	17,000	Texas........	40,000
Massachusetts.	1,500	Virginia......	1,300
Michigan.....	1,200	Washington...	200
Minnesota....	500	W. Virginia...	250

During the year much has been said for and against the induction of offenders into the ranks of the Army and the Navy. The Federal Government has not as yet seen fit to change the laws which prohibit this. Various plans for the mobilization of prisoners were advertised but without practical application. However, it is a fact that many ex-offenders have gone into military service surreptitiously and many have made good records.

New Institutions.—Chicago is planning something of an innovation in the handling of female lawbreakers. Three jails are to be operated exclusively by women and for women offenders. Three buildings for the department of juvenile research are to be erected on the Columbus, Ohio, State Hospital grounds. A State Farm for Women has been opened at East Lyme in the state of Connecticut. Plans are under consideration for a new penitentiary at Joliet; the old one is characterized as an architectural iniquity. Unfortunately, the construction of the new Sing Sing Prison and the new prison at Wingdale, both in New York, has been halted in order to conserve material during the war. The new Westchester County, New York, penitentiary has been taken over by the Federal Government, for convalescing soldiers. A city prison farm is being advocated by the Virginia State Board of Charities for Newport News to replace the jail, and also for juvenile offenders.

Miscellaneous. — What might be called the "Whitman" or "Illinois" system, as in a way a modification of the old "Irish" system, has been undertaken at Joliet. In the life of the prisoner four stages will be possible under the new plan:

1. Confinement in a cell without privileges.
2. Confinement in a cell with certain privileges earned by good conduct.
3. Residence in a cottage outside the prison walls, with supervision lessened.
4. Residence on the prison honor farm, with larger liberties and greater freedom.

An examination of the Pennsylvania prison system is under way. The work is under the guidance of Dr. George W. Kirchwey, who directed the New Jersey investigation of 1917. The results of the New Jersey investigation were embodied in a comprehensive report in two volumes, the second of which comprises a complete and painstaking history of the penal system of the state from the colonial period to the end of the year 1917, by Harry E. Barnes of Columbia University. So persuasive was this report that it resulted in a complete reorganization of the correctional system of the state by the legislature, all the penal, reformatory and charitable institutions under state control being combined under the management of a State Board of Charities and Corrections.

The self-government methods at the Preston School of Industry in California has had an effect upon Hawaii, where the Boys' Industrial School has adopted many of the features of the system. Self-government still prevails at Sing Sing and Auburn prisons in New York, but in a greatly restricted form. Thomas Mott Osborne, in charge of the Naval Prison at Portsmouth, reports encouraging progress with self-government at that institution. Reports from many sources indicate a desire on the part of administrators to repose more confidence and trust in their wards. One warden has gone so far as to permit some of the prisoners to go to town on Saturday evenings.

Prisoners' aid, especially from the standpoint of obtaining employment, has been less difficult. There is plenty of work and in most cases it is only the old and broken-down who apply to relief organizations for jobs. In some instances families of those in prison have been left entirely dependent because the one remaining support has been called to service. Such cases have at first been handled by the Red Cross and later referred to prison agencies.

Personal.—Nathan B. Allen, for several years warden of the Massachusetts State Prison, has resigned; he is succeeded by Elmer E. Shattuck, superintendent of the Prison Camp and Hospital at West Rutland. Dr. James A. Leonard, for 17 years superintendent of the Ohio State Reformatory, resigned on Aug. 1, and died on Aug. 11; he was a member of the International and the American Prison Associations, and was president of the latter in 1913. Dr. J. T. Gilmour, formerly warden of the Central Prison of Toronto and the Guelph Industrial Prison, and in 1917 appointed inspector of paroled prisoners, died in September.

Charles C. McClaughry, formerly warden of the State Reformatory of Iowa, has been made the new warden of the Connecticut State Prison at Wethersfield. Burdette G. Lewis of New York was appointed commissioner of charities and correction of New Jersey. Calvin Derrick, formerly warden of the Westchester County Penitentiary, has resigned to associate himself with Mr. Lewis, as head of the parole and prison-school work in New Jersey.

THE LIQUOR PROBLEM

John Koren

Legislation.—The most important act of the year was the adoption by Congress of the so-called war prohibition measure (see also XVI, *Agriculture*). Under its terms the manufacture and sale of all intoxicating beverages must cease on July 1, 1919, until the demobilization of the American troops has been completed, the date of which is to be determined and announced by the President. The act was originally intended to cover the period of the war as well as the completion of demobilization. From the present outlook the conclusion of peace will precede the date on which the measure becomes effective, and the question of the duration of war prohibition will depend upon the time required for demobilization. Under administrative order, for the conservation of the supply of cereals, the brewing of malt beverages ceased on Dec. 1.

National Prohibition.—The legislation of the states has centered largely upon the question of ratifying the national prohibition amendment, which received its thirty-sixth ratification on Jan. 16, 1919, and was proclaimed a part of the Federal Constitution on Jan. 29, 1919. The order in which the first 36 states ratified the amendment was as follows:

	Date of Ratification
Virginia	Jan. 10, 1918
Mississippi	Jan. 18, 1918
Kentucky	Jan. 14, 1918
South Carolina	Jan. 23, 1918
North Dakota	Jan. 25, 1918
Maryland	Feb. 13, 1918
Montana	Feb. 19, 1918
Texas	March 4, 1918
South Dakota	March 10, 1918
Delaware	March 18, 1918
Massachusetts	April 2, 1918
Arizona	May 27, 1918
Georgia	July 22, 1918
Louisiana	Aug. 3, 1918
Florida	Dec. 14. 1918
Michigan	Jan. 2. 1919
Ohio	Jan. 7, 1919
Oklahoma	Jan. 7, 1919
Idaho	Jan. 8, 1919
Maine	Jan. 8, 1919
Tennessee	Jan. 8, 1919
West Virginia	Jan. 9, 1919
California	Jan. 13, 1919
Washington	Jan. 13, 1919
Alabama	Jan. 14, 1919
Arkansas	Jan. 14, 1919
Illinois	Jan. 14, 1919
Indiana	Jan. 14, 1919
Iowa	Jan. 14, 1919
Kansas	Jan. 14, 1919
North Carolina	Jan. 14, 1919
New Hampshire	Jan. 15, 1919
Colorado	Jan. 15, 1919
Oregon	Jan. 15, 1919
Utah	Jan. 15, 1919
Nebraska	Jan. 16, 1919

Missouri and Wyoming also ratified the amendment on Jan. 16, 1919, and Wisconsin and Minnesota on the following day. The amendment is effective "after one year from the ratification of this article."

State Elections.—State-wide prohibition was adopted by Florida, Nevada, Ohio and Wyoming in November. Missouri and California voted against prohibition, while in Minnesota the total vote cast on the question was not sufficient for a decision, although the prohibitionists had the majority of the votes. In New York the election for governor turned more or less on the question of the ratification of the national prohibition amendment and resulted in the election of a governor who favored the submission of the question to the people. (See also V, *Amendments to State Constitutions.*)

Local-Option Elections.—The most noteworthy local option elections took place in the state of New York and resulted in a number of cities voting out the saloon. In Massachusetts, notwithstanding the fact that the national prohibition amendment had been ratified, the vote on license in the cities did not bring any additions to the "dry" column.

SOCIALISM

CARL D. THOMPSON

The Inter-Allied Socialists. — The one outstanding feature in international socialism during the year is the emergence and development of the inter-Allied socialist and labor movement. This has come about in the natural development of the socialist movement under war conditions, but also largely as a revolt within the socialist and labor movement itself against the extreme pacifist and anti-war position of the majority of the socialists in most of the nations. A series of conferences have been held during the year at which representatives were present from practically all of the Allied countries. The first was held in February, another in June, and a third in September. The last was the largest and most representative. There were 42 delegates present from Great Britain, representing over 6,600,000 members; three delegates from France, representing 1,500,000; four delegates from Italy, representing 172,000; eight delegates from Belgium, representing 350,000; while the delegates from other countries represented smaller numbers. At this September conference the American Federation of Labor was represented by five delegates, representing 3,000,000 members. These conferences adopted and published two documents that represent the highest and most constructive note so far struck by the socialist or labor movement of the world. One is on the war aims and peace terms of labor and the other a programme for social reconstruction.

War Aims and Peace Terms.—The February Inter-Allied Socialist and Labor Conference set forth an elaborate and detailed declaration of war aims and peace terms. These have been reiterated and enlarged upon by each conference held since. First, and most distinctive of all, is the unequivocal and reiterated declaration in support of the cause of the Allied nations against the Central Powers in the war. This declaration, which has been firmly maintained and reaffirmed at each succeeding conference, is in sharp contrast to that of the American Socialist Party, which from first to last has maintained an attitude of unyielding opposition to the war. It is also in direct contrast to the position of a greater or less portion of the socialist movement in all countries. In France, Italy, Russia, and even in England there has been a more or less important element in the socialist movement which has maintained an attitude of positive and active opposition to these Governments in the conduct of the war.

In brief, the declaration of these inter-Allied conferences "recognizes, in the present world war, a conflict between autocratic and democratic institutions," and "in accordance with the declarations of the previous conferences of February 14, 1915, and February 20 to 24, 1918, *declares it to be its unqualified determination to do all that lies within its power to assist the Allied countries . . .* and is inflexibly resolved to fight until victory is achieved" for the principles here set forth, and "supports the continuance of the struggle that the world may henceforth be made safe for democracy." The war aims and peace terms of President Wilson, and especially the 14 propositions laid down by him, are definitely accepted "as a concise summary of the main principles which the memorandum of war aims expounds, and agrees that only on these principles can the groundwork for a lasting peace be found." Aside from this distinctive and characteristic element of definite support of the war, the war aims and peace terms as set forth by the Inter-Allied Socialist and Labor Conference are those usually held by socialists everywhere. (See also II, *International Relations.*)

The Reconstruction Programme.—Besides the manifesto on war aims and peace terms, the conferences set forth an elaborate programme of social reconstruction distinctly socialistic and constructive in nature. The features of this programme which distinguish it from former pronouncements of labor and socialist bodies are as follows:

(1) A broader spirit and basis of appeal. The "working class" is spoken of repeatedly as including brain workers as well as hand workers, and "every grade and section of producers." Appeal is made not only to the workers, but to "the clerk, teacher, doctor, minister, the average retail storekeeper and trader, and all those living on small incomes —four-fifths of the whole nation."

(2) A series of very definite and concrete, constructive proposals aimed to achieve the following purposes: (*a*) a universal national minimum, "securing to every member of the community all the requisites of healthy life and worthy citizenship"; (*b*) the democratic control of industry; (*c*) a revolution in national finance; and (*d*) the surplus wealth for the common good.

(3) A complete social transformation. "What we now promulgate," they say, "is not merely this or that specific reform, but a deliberately thought out, systematic and comprehensive plan for immediate social rebuilding."

Besides the conferences of the inter-Allied socialists there was to have been a general international conference in Switzerland in September, but the various Governments refused passports to the delegates and the conference had to be given up.

United States.—The American Socialist Party has held steadily to its position of "continuous, active and public opposition to the war," as declared by its famous St. Louis platform of 1917 (*A. Y. B.*, 1917, pp. 31, 395). Numerous attempts were made by different minority groups within the party to secure a repudiation or at least a revision and restatement of the party position, but all were unsuccessful, the Executive Committee going so far in one case as to issue a statement refusing to submit the matter to a referendum vote of the membership for decision. This action of the majority of the Party has caused the dissatisfaction and deflections that occurred in 1917 to increase. Allan Benson, who was candidate of the party for President in 1916, and other prominent members have withdrawn from the Party during the year. The entire Slovenian Federation, one of the language groups, withdrew in a body during the early fall, and the Bohemian Federation is taking a referendum upon a proposal to withdraw.

In consequence of the policy of the Party in opposing the Government in its conduct of the war, most of the socialist press has been denied the second-class mailing privileges and several prominent members and officials of the party have been arrested and convicted under the Espionage Act and other laws. Eugene V. Debs, three times candidate for President on the Socialist ticket, was sentenced to ten years' imprisonment, but has appealed the case. Adolph Germer, the National Secretary of the Party, Victor L. Berger, and many others are now on trial, and hundreds have been sent to jail.

In spite of these difficulties and the numerous withdrawals, the membership of the party has been maintained at about the same figure as last year. The average membership for 1916 was 83,284; for 1917 it was 80,694; and for 1918 it was 74,519. The National Office also estimates that on the whole the vote of the party has been maintained, although it is admitted that in some quarters it has fallen off very decidedly. The most noted victory was in Milwaukee, where in the November election Victor L. Berger was again elected to Congress; eleven assemblymen and three state senators together with the entire county ticket were also elected. On the other hand, in the fall elections in Minneapolis the Socialists failed to reëlect Thomas Van Lear, the Socialist mayor, and in New York City Meyer London, the Socialist member of Congress, was defeated for reëlection. Elsewhere the vote fell off considerably.

The Social Democratic League.—The socialists who opposed the position taken by the American Party on the war question have formed a separate organization known as the Social Democratic League. The objects of the League are "the practical advancement of democratic socialism through educational methods," its policies being non-partisan. It is sharply at variance with the Socialist Party on the war question, in this matter supporting the war upon the same basis as the Inter-Allied Socialist and Labor Conference. Charles Edward Russell is chairman of the League, William English Walling, secretary, and J. Phelps Stokes, treasurer. The principal organ is the *New Appeal*, published at Girard, Kans. The headquarters of the League is at 277 Broadway, New York City.

Europe.—The Bolsheviki celebrated the first anniversary of their capture of the reins of government in Russia on Nov. 7. Though experiencing many vicissitudes, they continue in power and are administering the Government upon an extreme socialistic basis. (See also III, *Russia*.)

The anti-war faction of the German Socialists continued to gain strength through the year. Karl Liebknecht was released from prison in October. The majority or conservative faction, however, continued in control and seemed likely to hold the upper hand. (See also III, *Germany*.)

In France the year witnessed a serious struggle between the pro-war and anti-war factions of the French Socialists, the latter seeming to be in the majority towards the close. The 40 Socialist members of the extreme right in the Chamber of Deputies formed a separate group known as the Varenne Quarante pledged to the prosecution of the war until the Allies secured a complete victory. The opposing group led by Longuet opposed the war credits, pronounced against intervention in Russia, and demanded a revision of the war aims of the Allies, etc.

VOCATIONAL EDUCATION AND GUIDANCE

Arthur D. Dean

Vocational Education for War Service.—The war has demonstrated the value of education, and particularly of technical preparation for special kinds of work. The Government developed an aggressive and comprehensive educational policy contributory to winning the war, the potential beneficial effects of which cannot be fully appraised even by those directly responsible for its administration. The entire vocational-education programme of the country has been turned over to war needs. The vocational and technical schools have proved their worth in such a multiplicity of emergency tasks and under such a variety of circumstances that it will be impossible hereafter to debate the question of their value. The conclusion does not rest on a sentimental ground or on prejudice; it is a verdict based on performance.

The War Department has given mechanical training to enlisted men in practically all of the trade schools, engineering colleges and technical high schools in the country. This training was given in short, intensive courses of eight weeks each, classes meeting eight hours daily, and it was given under Army discipline and on the Army pay and subsistence allowances. It was such as to give the men practical skill in the fundamental operations of selected trade processes, including carpentry, blacksmithing, metal working, automobile work, and other mechanical activities useful in the Army. The War Department emphasizes the fact that it did not send these soldiers to the schools in order that they might become skilled mechanics, but rather that the schools might give some mechanical training to soldiers.

Training of Shipbuilders.—The U. S. Shipping Board undertook a comprehensive project of great educational interest for training instructors and skilled mechanics for the ship-building industry. An industrial-training section in the Emergency Fleet Corporation was organized for the purpose of establishing a training department in each shipyard. The supply of mechanics in the country to carry out the programme of the Shipping Board was utterly inadequate, and the officials came to the conclusion that further increase of working force must be made through training men and that it must be done immediately and on an unprecedented scale. The first important task was to establish an instructors' training center in charge of a staff of industrial-education experts, and each shipyard was invited to send to this training center one or two prospective directors and a delegation of skilled workers representing the trades in which skilled men were most needed. The staff of industrial education officers put these skilled workers in possession of effective methods of giving trade instruction. The course extended for a period of six weeks. One-half of each day they were instructed in the methods and devices of teaching; during the other half they were employed in actually instructing groups of workers in the yards. At the completion of training they returned to their own yards and set up training classes for breaking in new men.

Reëducation of Disabled Soldiers and Sailors.—The Surgeon-General's Office of the U. S. Army, through its Division of Physical Reconstruction, has organized courses in vocational education and vocational guidance in those hospitals which have been designated as general, convalescent and reconstruction hospitals. As soon as the circumstances of each case permits, the disabled soldier begins some line of manual activity at the bedside or in the ward, and later is assigned to the curative workshop, where he is given instruction preparatory to his own selection of the occupation to which he seems best fitted. Basketry, weaving, clay modeling and other occupations are given at or near the bedside for strictly therapeutic purposes. Typewriting, telegraphy and academic work are given at the bedside to disabled soldiers when the disabilities permit of such work. This work has therapeutic value but in a different sense than the arts and crafts work given under the usual head of occupational therapy. Agriculture, mechanical drawing, automobile repairing, bookkeeping, linotype operating, shoe repairing, tailoring, etc., are now being carried on in the educational departments of the reconstruction hospitals.

On June 27, 1918, the Smith-Sears Vocational Rehabilitation Act was passed providing for the vocational rehabilitation and return to civil life of disabled men discharged from the military or naval forces of the United States. The Act delegated to the

Federal Board for Vocational Education the responsibility for reëducating the disabled men in some useful employment, and provided for a plan of coöperation between the Federal Board and the Surgeon-General's Office covering the work in the hospitals in order that the patients might have the advantages of a continuous and coördinated plan. The organization of the staff for vocational rehabilitation in the Federal Board provides for six superintendents and a number of district vocational officers. Out of the experience gained from the rehabilitation of disabled soldiers, it is expected that vocational education will provide later for the maimed victims of industrial accidents. (See also XXX, *Education.*)

National Aid for Vocational Education.—The Federal Board for Vocational Education has established a complete working organization for the promotion of national aid for vocational education. It has found that the problem of adequate vocational teachers is a most serious one. It has placed its greatest emphasis on teacher training. With the single exception of the fund for vocational education in Rhode Island, all the 48 states have accepted the provisions of all three funds under the Smith-Hughes Act. An important decision of the Federal Board affecting part-time classes provides that such classes may be carried on in the school, in the shop, or in schoolrooms adjacent to the shop or elsewhere, and that the instruction may be a manipulative process or any book instruction relative to this process or both, and that reimbursement may be made from Federal funds for one-half the salary of the instructor, including the coördinator. This ruling had the effect of greatly stimulating the development of part-time instruction. Two interesting studies, one in connection with the textile and the other in connection with the mining interests, are being made by the Federal Board for Vocational Education, in order to determine the possibility of establishing type schools representing these industries that may be established through coöperation with the Federal Board for Vocational Education, state boards of education, local boards of education, and organizations of manufacturers and employees. (See also XXX, *Education.*)

The Boys Working Reserve.—The U. S. Boys Working Reserve, with an avowed object of the mobilization of all the boys in the country of high-school age for war service, has had a beneficial effect upon the boy's impulse to make his war contribution. It was organized under the Federal Department of Labor. Its purpose was to assist in meeting the shortage of labor made acute by the withdrawal of millions of men from farm and shop for the Army and Navy and for the manufacture of munitions and other things necessary to the prosecution of the war. It has established coöperative working relations in all the states. It did not displace or disrupt existing organizations or urge boys to leave school. It promoted an educational programme for out of school service on the farm and in the shop and the store.

UNEMPLOYMENT

JOHN B. ANDREWS

The Labor Shortage. — In 1918, through the development of a more adequate national system of public employment bureaus, authoritative facts on employment conditions throughout the country were for the first time available. In the first months of the year, before such information had been secured, conflicting reports on the state of employment were current. On the one hand, it was claimed that the scarcity of labor was so great that industrial conscription was necessary, and bills to that effect were introduced in Congress. On the other hand, the director of the U. S. Employment Service asserted in January that "labor shortage is a myth" and that any apparent shortage was due to faulty distribution.

Following the expansion of the Employment Service (see *infra*), it began to receive weekly reports on the state of the labor supply from all parts of the country. At the end of

April a scarcity of machinists and toolmakers was announced, which was said to be reducing war production to 75 per cent. of maximum. By the last of June the shortage of machinists had "reached a critical stage" and "the ordinary sources of supply were drained dry." At this time the Employment Service began a canvass to find out the needs of the war industries for unskilled labor. Up to July 31 a shortage of 451,000 common laborers had been reported by such plants. A month later the Employment Service stated that the shortage had doubled. Active steps to supply the needs of war industries by transfer of workers from non-essentials were under way (see *infra*) when the signing of the armistice on Nov. 11 transformed the situation. But two weeks after the armistice the Employment Service still reported the labor supply below the demand. In New York none of the war plants replying to a questionnaire planned to release workers at the time and five asked for additional workers. Forty non-war plants requested 21,000 more employees. By the end of the year, however, the cancellation of war contracts had produced considerable unemployment in industrial centers. in the northern part of the country, from Massachusetts through the Connecticut munition towns and northern New York, Ohio and Michigan, as far west as Minnesota.

Organization of the U. S. Employment Service.—At the beginning of the year the national system of public employment bureaus, the Employment Service, consisted of the Bureau of Immigration in the Department of Labor, which operated about 90 offices. On Jan. 3 the Secretary of Labor announced its separation from the Immigration Bureau, and on March 9 its permanent organization as one of the eight new services of the war-labor administration (see XV, *Labor*). Under one of its divisions were the Public Service Reserve of skilled men who agreed to take war jobs wherever the Government wanted them and the Boys Working Reserve, of youths between 16 and 21 for farm work and other essential industries during school vacations (see also *Vocational Education, supra*). In place of the 13 employment districts into which the country had formerly been divided, a director of employment was appointed in each state to have charge of the employment work. He was assisted in choosing employees and in mapping out general policies by an advisory board composed at first of two representatives of employers and two of employees. On Oct. 15 the Secretary of Labor requested that two women representatives be added to each board.

Scope of the U. S. Employment Service.—Under its new organization the Service was rapidly extended, reporting Nov. 25 that it had opened over 900 offices. In the *Employment Service Bulletin* of Nov. 7, 785 offices were listed, covering every state, Porto Rico, and the District of Columbia. The states having the largest number of offices were Illinois, with 64, New York, 69, and Ohio, 74. There were a number of offices specializing in the placement of women workers, railroad labor, and farm help, one in Chicago covering education and engineering, and one in New York for the professions in general.

In June the Government took control of the hiring of all dock labor. A plan for systematic organization was first tried in New York, where a central office was established, with eight branches at piers devoted to trans-Atlantic trade and clearing houses to facilitate the transfer of men from one wharf to another. An elaborate system of coöperating agencies for placing farm labor was developed (see also XVI, *Agriculture*). Many special offices were opened and field agents were sent out in sections where there was an acute labor shortage or where large numbers of farm hands were needed. During the harvest season a chain of temporary offices with telegraph connections was opened in the grain belt from Oklahoma to North Dakota to direct the migratory harvest hands. In 13 of the principal agricultural states during the six months ending July 30, the number of placements of permanent farm workers, exclusive of harvest hands, members of the Boys Working Reserve, or part-time community workers, was 87,266. The total number of workers asked for by farmers in these states during the period, however, was 175,733. Special work was also done by the Employment Service in recruiting shipyard mechanics; an effort was made to secure 250,000 men during February and about 260,000 were registered.

The Employment Service reported the following results of its work for 1918: registrations for employment, 4,211,942; applications from employers, 8,799,798; referred to jobs, 3,931,560; placed in jobs, 3,099,295.

Increased Control of the Labor Market.—Competitive bidding of war contractors and the consequent excessive shifting of labor and disorganization of war production caused steps to be taken to center the control of the labor supply in public employment bureaus to a much greater extent than had previously been done in this country. As early as the middle of March the U. S. Employment Service requested all Atlantic coast shipyards to hire workers only through its offices. On May 17 the Railroad Administration asked the Labor Department for help in preventing the disorganization of its forces through the offers of private labor agents. An appeal by President Wilson on June 17 urged all employers engaged in war work to hire unskilled labor exclusively through the Employment Service after Aug. 1. On July 11 the War Industries Board adopted a resolution against the use of "competitive peace-time methods" in hiring labor, which resulted in its "shifting from war work," and said that it would withdraw priority assistance from manufacturers who persisted in the practice.

To carry out the President's order and to arrange for the shifting of labor from non-essential to war work, detailed regulations were made by the Employment Service. The order was applied only to war plants having more than 100 employees, each of which was assigned to an agent of the Employment Service who would try to fill its labor needs. In these plants advertising for help, interstate transportation of labor, and continuance of the work of the company's own field agents were allowed only by special permission, but laborers who applied at the factory without solicitation might be hired. Coal mining was considered war work, but farming and railroading were not included, though they were to be protected from recruiting by other agencies.

Each state was assigned a quota of unskilled labor, from which shortages in war plants were to be filled. The securing of this and later the general problem of transferring employees from non-essential to war industries was put in charge of "community labor boards." Each of these consisted at first of one representative of employers and one of employees, together with the local employment director. Later two women were added. By the end of August 915 such boards had been formed in 39 states. They were to depend as far as possible on the voluntary coöperation of employers in securing workers, but if necessary they could call on the War Industries Board to withhold fuel, material and transportation facilities from a non-essential plant. During August, the first month in which the system was in operation, between 50,000 and 60,000 unskilled laborers were transferred from states having a surplus to those having a shortage. For use in aiding concentration of activity on essentials, the War Industries Board on Sept. 3 issued a "priorities list" in which the country's industries were divided into four classes according to their importance during the war.

Another expedient to discourage unnecessary shifting of labor was adopted in New Jersey on July 1. Manufacturers agreed with the Labor Department that they would require every man seeking employment to show a card from a public employment bureau showing where he worked last and why he left.

"Work or Fight".—Efforts to utilize the maximum proportion of the country's labor power in productive industry during the war found expression in the Provost-Marshal-General's "work or fight" order and in the enactment of "anti-loafing" laws by nine states (see XV, *Labor Legislation*), in addition to the two enacting them in 1917. The "work or fight" order, issued on May 24, made all draft registrants not engaged in a "useful occupation" liable to immediate induction into military service after July 1. The order was defined as applying to gamblers, attendants at bucket shops and race tracks, fortune tellers, and also men serving food and drink, passenger-elevator operators, doormen, and so on, ushers and other attendants in amusement places, and sales clerks in mercantile establishments. But few facts are available about the effects of the eleven "anti-loafing" laws, which required all able-bodied adult males to be usefully employed under penalty of arrest. Few arrests were reported and in some localities the laws were apparently regarded as a joke. In Baltimore, however, where the law had been in effect since 1917, it was claimed to be effective in keeping shiftless men at work.

Scientific Employment Management.—The creation of separate employment departments concerned with the hiring and dismissal of workers and other problems of labor management was strongly advocated by the War Industries Board as a means of reducing labor turnover and keeping production at a high level. A separate employment managers' division was formed in the Board, which arranged six weeks' intensive training courses for men and women employment managers at six colleges. In September the chairman of the War Industries Board stated that the community labor boards would not be favorably impressed by requests for help from essential industries unless employment departments on a scientific basis were maintained.

Employment Problems of Demobilization.—In returning to peace-time occupations the millions of soldiers and sailors and workers on war contracts, the country faced an employment problem of the first magnitude. Information available up to Dec. 1 indicated that the Government realized the importance of preventing a crisis of unemployment at this time and planned to make the Federal Employment Service an important factor in the work. On Nov. 24 announcement was made that the War Department would be guided in cancelling war contracts and demobilizing the army by information on the state of the labor market supplied by the community labor boards. These were to provide weekly reports of the industries in their neighborhoods which planned to lay off or to take on additional labor. The Employment Service was to be consulted, moreover, before contracts were cancelled, and contractors were requested to notify it when they released men. The service planned to have an agent in each demobilization camp to assist in directing men to jobs. On Dec. 10 it announced that, following conferences with the various agencies concerned, the coöperation of local councils of defense, draft boards, and numerous welfare organizations had been secured in opening employment "Bureaus for Returning Soldiers, Sailors and War Workers" throughout the country. In these bureaus all information about available positions was to be centralized, though men might call for help on any of the coöperating organizations. The War Labor Policies Board asked the principal cities to determine what postponed public works they could now undertake to help keep up the volume of employment, and asked that they notify the Employment Service of the workers needed for them.

Among the placements of war workers made by the Federal Service within the first two weeks after the signing of the armistice were 2,000 workers from a gas-mask factory in New York City, 6,700 workers from an airplane and a nitrate plant in Ohio, and 8,000 construction laborers from Camp Polk and Camp Jackson. These represented, of course, only a small fraction of those likely to need new positions within the next few months.

Up to the end of 1918, demobilization proceeded on the whole according to military organization rather than the demands of industry. The War Department granted priority in discharge to anthracite coal miners and, on their own application to a limited number of other men who were urgently needed in their former occupations. But it was claimed on account of the additional clerical work involved plans for demobilization on a strictly occupational basis were to be put into effect only in case of a serious unemployment crisis.

XV. LABOR AND LABOR LEGISLATION

LABOR

JOHN B. ANDREWS

LABOR AND WAR

Labor's Attitude Toward the War.—Organized labor, as represented by the American Federation of Labor, continued to give hearty support to the war in 1918. Early in February, the Executive Council of the Federation issued a statement that "this is labor's war." The struggle was one of freedom and democracy against autocracy and force, and "the hope of labor lies in opportunity for freedom." The week of Feb. 10 was observed as "Labor Loyalty Week," with special observances on Lincoln's Birthday. The annual convention of the Federation, held at St. Paul in June, was marked by patriotic fervor. The sections of the Executive Council's report which dealt with the war were unanimously adopted. These stated that no strike should be inaugurated which could not be justified to the man risking his life on the firing line in France. "Principles of justice", fundamental to the coöperation of labor and capital, to winning the war and to the reconstruction period, were enumerated, including equal voice and equal representation of workers in matters affecting their interests, an expert employment manager in each firm drawn from the ranks of labor, acknowledgment of the "right to organize" and the organization of unskilled labor, a "just portion" of wealth for the worker and equal opportunities for his children, compensation for industrial accidents and occupational diseases, and vocational rehabilitation for the injured. The Executive Committee was empowered to appoint a committee on reconstruction to investigate the problem and prepare appropriate legislation. Up to Dec. 31 the committee had not reported.

The more radical minority element in the labor movement, which had, in general, opposed American participation in the war (*A. Y. B.*, 1917, p. 412), showed a considerable revulsion of feeling following the Brest-Litovsk treaty between Russia and Germany (see II, *International Relations*). Labor groups previously indifferent or even opposed to the war passed resolutions in favor of its vigorous prosecution and assisted in the Third Liberty Loan. The pacifist Workmen's Council for Maintenance of Labor's Rights (*A. Y. B.*, 1917, p. 412) was not active during 1918, and was said to have practically dissolved by November. American intervention in Russia (see II, *International Relations*), however, to some extent rekindled hostility in these extremist groups.

Labor's International Relations.—Closer relations with the labor movements of the Allied countries naturally followed American participation in the war. At an Inter-Allied Labor Conference opening at London on Feb. 20, which agreed on a joint statement of war aims and projected an international labor conference on the subject to include representatives of the Central Powers, the absence of American delegates caused some comment. It was claimed that the Americans had refused to come from suspicion that the conference was under pacifist and pro-German control. The president of the American Federation of Labor stated, however, that American labor's failure to participate was due to receiving the invitation too late. The cable accusing the conference of pro-Germanism was garbled. He added that his reply included the fact that the Executive Council of the Federation had unanimously voted against an international conference to which representatives of enemy countries were admitted.

The Inter-Allied Conference attempted to send delegates to America, but passports were refused them, as they were a few months later to delegates from the British Trades Union Congress. On Feb. 25 President Gompers announced that he had refused an invitation from the head of the German Federation of Trade Unions to attend or send representatives to a conference to discuss peace. Soon after, a "labor mission" composed of nine trade unionists was sent abroad to confer with representatives of organized labor in England and France. On its return in June the mission recommended that the American Federation of Labor maintain representatives in Europe throughout the war. Appointment of five delegates to an International Labor Congress to be held in Europe at the time of the peace conference was announced by the Executive Council of the Federation on Nov. 30.

Another Inter-Allied Labor and Socialist Conference was held in London in September, which was attended by the president and other delegates from the American Federation of Labor. The American group urged the acceptance of the 14 points laid down by President Wilson as peace terms (see II, *International Relations*), and the Conference agreed to these as summarizing their previous statements and the only "groundwork for a lasting peace." The Conference also agreed to the American proposal for labor representation at the peace conference and a concurrent international labor congress. The Americans also put forward the following propositions to be urged as a "labor charter" in the peace treaty: that labor should be declared not a commodity or article of commerce; that the rights of free assemblage, free association, free speech and a free press should not be abridged; that sailors might leave their vessels in safe harbors; that involuntary servitude should not exist except as punishment for crime; that commodities made by children under 16 should not be carried in international commerce; that the basic work day should not exceed eight hours; and that trial by jury should be guaranteed. The resolution of the Inter-Allied Conference on these standards stated that most of these "aspirations" found expression in general terms in the February memorandum on war aims, while others, such as that relating to trial by jury, were not applicable to all countries. They were recommended, however, to the labor and socialist movements of the various countries for consideration, the first and third, removing labor from the class of commodities and allowing sailors in harbor to leave their vessels, being considered especially important. (See also XIV, *Socialism.*)

The American Federation of Labor in 1918 also devoted considerable attention to closer relations with the Mexican and South American labor movements. In May an American labor mission went to Mexico in the interests of a Pan-American Labor Federation. It reported that it had urged the formation of a Mexican Federation of Labor and had been the subject of violent attacks by German propagandists. On June 27 a formal meeting of a Pan-American Federation of Labor Conference Committee was held at Washington. The attendance included two Mexicans. The Committee recommended that a Pan-American labor conference should be held on the Mexican-American frontier at the earliest possible date. Such a conference should consider the establishment of a Pan-American Federation of Labor, better conditions for workmen migrating between Mexico and the United States, and better relations between the labor movements and peoples of the two countries. The conference recommended was held at Laredo, Tex., opening Nov. 13. It was attended by 150 delegates representing the United States, Mexico, Central America and Colombia, and included the Secretary of Labor of the United States and the president of the American Federation of Labor. Delegates from other South American countries were prevented from attending by the influenza epidemic. A permanent organization was effected. Subject to referendum vote by the Mexican labor organizations, the conference went on record in favor of the war aims adopted at the September Inter-Allied Labor Conference.

War-Labor Administration. — The year witnessed a multiplication of Federal agencies to deal with labor matters during the war, and some noteworthy efforts to coördinate them and develop a complete war-labor administration. As the result of a series of conferences, the Council of National Defense early in January submitted a programme of war-labor administration to President Wilson. The President approved it and requested the Secretary of Labor to undertake the administration. The plan undertook to provide for insuring a supply of labor, for adjusting labor disputes without stoppage of work, for safeguarding the labor and living conditions of war workers, for a fact-gathering body, and for an agency for information and educational purposes. It was intended that existing bureaus in the Department of Labor should be utilized whenever possible.

The Secretary of Labor immediately appointed an advisory council, made up of representatives of labor and capital, to work out the details of such a programme. The report of the advisory council was approved by the secretary on Jan. 28. It recommended the creation of several new divisions in the Department of Labor, and the continuance of the established industrial-service sections in the War and Navy Departments and Shipping Board, under final control by the Department of Labor. Such control was to be effected by means of a "policies board" representing the various production departments of the Government and bureaus of the Department of Labor. The Secretary asked the various labor committees of the Council of National Defense (*A. Y. B.*, 1917, p. 413) to continue until the new organization was ready to take over their duties.

On July 15 the Secretary of Labor announced the completion of the war reorganization of his Department. The proposed programme had been somewhat modified as the situation had seemed to require. New divisions in the Department included an enlarged employment service and "services" of information and education, labor adjustment, training and dilution, working conditions, investigation and inspection, women in industry, industrial housing and transportation, and civilian insignia, besides the War Labor Policies Board. A special assistant to the Secretary of Labor was appointed to be in charge of war-labor administration, who was chairman of the latter body which also comprised several Labor Department representatives and persons from the various production departments of the Government, including the War, Navy and Agriculture Departments, the Food, Fuel and Railway Administrations, the War Industries Board, the Shipping Board, and the Emergency Fleet Corporation. The purpose of the Policies Board was to secure a uniform labor policy on all war work for the different Government departments, which the shortage and excessive shifting of labor had rendered especially necessary. To that end it dealt with centralized plans for recruiting labor, standardized working conditions and wages, and the development of uniform labor clauses in all Government contracts.

On Nov. 29 the Secretary of Labor appointed an advisory committee to work out plans for the readjustment of the Department from a war to a peace basis. In his annual report, made public on Dec. 12, the continuation of the War Labor Board was advocated as a reconstruction measure. (See also I, *War Organization.*)

Another important agency of war-labor administration, not, however, a part of the Labor Department proper, was the National War Labor Board. On Jan. 28 the Secretary of Labor called upon the National Industrial Conference Board, a country-wide federation of employers' associations, and on the American Federation of Labor, each to nominate five representatives to a conference board, which should agree on principles to govern the relations between labor and capital during the war. This war-labor conference board reported on March 29 recommending the creation during the period of the war of a similarly organized board to settle labor disputes in industries necessary to the prosecution of the war. The board should bring about agreements between the contending parties whenever possible, first through local committees which it should set up, and if their efforts failed, through the national board. If the voluntary efforts of the board were unsuccessful and if it could not agree unanimously on a decision, the dispute was to be settled by an umpire chosen unanimously by the board, or, if such choice proved impossible, by the person chosen by lot from a list of ten "suitable and disinterested persons" nominated by the President of the United States. The board should not take up any controversies in which there existed by agreement or Federal law any means of settlement not yet tried. On April 8 the President approved by proclamation the creation of such a National War Labor Board, operating under the methods and principles laid down by the conference board (see "Labor Standards," *infra*). He urged all employers and employees to make use of it and to avoid any cessation of work pending its action. The personnel of the board was the same as that of the conference board with the addition of two representatives of the public, selected by the employers' and employees' representatives, respectively. On Dec. 6 the War Labor Board, on account of the withdrawal of Government control over industry, announced that its future activities would be limited to cases voluntarily submitted to it by both parties. (See also I, *War Organization.*)

Extensive organizations to handle labor matters were also developed in the War Department. The Industrial Service Section of the Ordnance Bureau contained in July, after considerable reorganization, branches on administration, including employment, women, mediation, and community organization. The Quartermaster's Department included an Industrial Relations Branch. In January the Board of Clothing Standards (*A. Y. B.*, 1917, p. 415) was dissolved on the ground that its duties had been completed with the preparation of labor clauses for clothing contracts to insure healthful working conditions and uninterrupted production. The work of enforcing these provisions was transferred to a single "administrator for labor standards in the manufacture of army clothing" under the Industrial Relations Branch. In the Signal Corps, labor problems were handled by the Coördination Division of the Executive Department.

Both the Food and the Fuel Administrations maintained "labor advisers," and the latter created in July a Bureau of Labor, headed by a former officer of the United Mine Workers and a mine operator, for the settlement of trade disputes. The Shipping Board set up an Industrial Service Section and the Emergency Fleet Corporation an Industrial Service Group. A Division of Industry was formed by the Committee on Public Information in February, whose chief also held a position in the Department of Labor. In this way it was planned to keep the two agencies in touch with one another. The first work of the Division was announced to be the supplying of information to manufacturers as to what the Labor Department could do for them.

Labor matters were dealt with by several agencies formed by the Railway Administration. In January, following demands for increased wages by the railroad brotherhoods, a temporary Railway Wage Commission of "four representative men" was set up, to investigate and make recommendations on the whole railroad wage situation (see "Wages," *infra*). Shortly thereafter announcement was made that it was planned to create three boards of adjustment for settling disputes, such as the application of the Adamson eight-hour law, the interpretation of the Railway Wage Commission's award, and personal grievances, but not any of the general questions regarding hours or wage scales. Railway Board of Adjustment No. 1 was constituted on March 22, including four representatives of the four trainmen's brotherhoods and four representatives of the management. The second board, organized on May 31, covered all railroad shopmen, including electrical workers. The third board, which was not formed until November, represented the remaining organized employees, among them telegraphers, clerks, switchmen, signal maintainers and maintenance-of-way employees.

On Aug. 29 the formation of a Women's Service Section was announced, the purpose of which was given as attention to the "conditions of employment of women on railroads under Federal control."

Labor representation on bodies not dealing entirely with labor matters was found on the Treasury's committee on the taxation of war profits and the War Industries Board. (See also I, *War Organization.*)

Labor Standards on War Work.—In 1918 it was found possible not merely to maintain existing labor standards, but, in certain cases, to raise them in the interests of welfare and efficiency. This was particularly noticeable in the field of women's work. The National War Labor Board in its declaration of principles to govern the relations of labor and capital during the war period, approved by the President on April 8, announced that women on men's work should be given equal pay and should not be allotted "tasks disproportionate to their strength." Soon after, the Women's Committee of the Council of National Defense adopted "General Orders, No. 13" (*A. Y. B.*, 1917, p. 415), of the Ordnance Bureau as their standards for women in industry. In July the War Labor Policies Board announced the Government's policy in necessary war-time replacements of men by women. Women were to be encouraged to enter suitable occupations, such as clerical and mercantile positions, but not employments unfit physically or morally, such as work in saloons and mines. Existing laws and standards for health and safety should be maintained, extensions to the new occupations made if needed, the employment of mothers with young children discouraged, and no men displaced unnecessarily. The policy of the Railway Administration, as disclosed in the Director-General's first report to the President, was that women should receive the same pay as men for equal work and should not be employed in "unsuitable" positions or under "unfit" conditions.

Action by the Federal Government covering both men and women workers included an announcement by the Public Health Service that it was taking steps to protect the lives and health of munition workers with special reference to the dangerous poison and explosive trinitrotoluol ("TNT"). General Orders No. 8 of the Railroad Administration stated that all Federal laws for the promotion of safety, covering hours of service, safety appliances and inspection, would remain in force. Following the setting aside of the Federal child-labor law as unconstitutional (see *Court Decisions, infra*), the United States Employment Service told its employees to continue to observe its standards in the placing of children. President Wilson vetoed the Legislative, Executive, and Judicial Appropriation bill because it increased the hours of Government clerks from seven to eight. On the other hand, the law requiring an eight-hour day on Government contracts was suspended by executive order in several cases, important among which were work on the Alaskan railway, the repair and loading of all vessels controlled by the Shipping Board, and all work on Government housing projects. The New York one-day-of-rest-in-seven law was suspended for adult males in certain plants and railroad shops at the request of Federal officials.

Farreaching action to secure uniform labor clauses on all Government contracts was begun by the War Labor Policies Board. Its first announcement in July stated that all the Government's production departments would require full compliance with state child-labor laws on all contracts, and in addition the prohibition of all work by children under 14 and of night work by children under 16. The latter must be restricted to an eight-hour day. The employment of prison labor by contractors was also forbidden. Next the Board prepared contract provisions requiring the observance of all state labor laws, and each Government department concerned authorized the designation of special representatives to see that these clauses were enforced. The Policies Board called a conference of Federal and state officials to plan cooperation in enforcement of these provisions which met in Washington on Oct. 1. A resolution was passed opposing any lowering of labor standards unless recommended by competent Federal authority. On Dec. 12 the adoption of standards governing the employment of women in industry was announced. These included the eight-hour day, one day of rest in seven, prohibition of night work and of industrial home work, wage rates "established on the basis of occupation and not that of sex," and comprehensive provisions for health and safety.

The principles adopted by the War Labor Board to govern the relations of labor and capital during the war, which were approved by executive proclamation of April 8, dealt with collective bargaining as well as with protective standards. In brief they stated that there should be no strike or lockout during the war. The "right to organize" and to bargain collectively was fully recognized. Employers should not discharge workers for trade-union membership or for legitimate trade-union activities, and employees should not use coercive measures to induce persons to join their organizations or employers to bargain collectively. Existing union and open shops should continue unchanged. Established safeguards for the protection of health and safety should not be relaxed. The basic eight-hour day should apply wherever existing law required it; otherwise hours should be fixed according to Government necessities and the welfare, health and proper comfort of the workers. All practices by employers or employees which limited output or increased its cost should be discouraged. The right of all workers, including unskilled laborers, to a living wage was affirmed. On these principles, later approved by the National Association of Manufacturers, the later decisions of the National War Labor Board were based.

Special action regarding women workers by agencies administering labor laws in three states should be noted. The Kansas Industrial Welfare Commission formed a War Board whose purpose, as announced in an open letter to the employers of the state, was not only to enforce existing legal standards but to raise them where necessary. The Industrial Board of the Pennsylvania Department of Labor called for all possible safeguards for working women and warned against the tendency to employ them in tasks beyond their strength. A War Emergency Conference called together by the Washington Industrial Welfare Commission resulted in prohibition of the employment of women for two months before and six weeks after childbirth, and at all times in occupations "harmful to health, morals, or womanhood, unavoidably disfiguring," or for which men are better suited and available, and in establishing a wartime minimum wage of $13.20 a week.

Woman and Child Labor.—The armistice between the Allies and Germany was signed at a time when extensive replacement of men by women seemed to be imminent. In September the chairman of the War Industries Board said that additional women were needed to bring war production to its maximum and that they must be ready in large numbers when the extension of the draft act called men between 18 and 45. In October the U. S. Employment Service began a campaign to replace men by women in every possible opening, and in November the Department of Labor urged all unoccupied women to take regular paid positions.

Up to November, however, the number of women substitutes for men workers remained comparatively small. In addition to the kinds of work described in the YEAR BOOK for 1917 (p. 416) the work of women in transportation was noteworthy. They were hired for a considerable variety of occupations on the steam railroads, as section hands, crossing tenders, freight checkers, freight haulers on wharves, parcel-room attendants and ticket agents. Considerable discussion arose about the employment of women as street-car conductors in New York, Newark, Cleveland, Detroit, and other large cities. After investigation in New York, the U. S. Bureau of Labor Statistics stated that street-car employment was one of the least suitable occupations for women. A Brooklyn grand jury scored the conditions under which women worked in that borough. In settling a dispute in Cleveland the Federal Department of Labor ruled that women should be taken off the cars after Nov. 1. Failure by the company to carry out the ruling caused a brief strike of the men early in December. As a compromise its application was finally postponed until March 1, 1919. On the other hand, the Women's Trade Union League was recorded in favor of improving working conditions rather than barring out the women. The labor organization concerned, the Amalgamated Association of Street Railway Employees, reversing a previous stand, resolved to admit women to membership provided no favoritism was shown them.

A "work or fight" order of the Provost-Marshal General (see I, *War Organization*), which refused deferred classification to men of draft age employed as waiters, ushers, passenger-elevator operators and salesmen in mercantile establishments, tended to increase the number of women in these lines. Wider professional opportunities were opened in civil-service positions, in draftsmanship, and in industrial laboratories. In the East there was a considerable increase in the number of women farm laborers, most of whom worked as groups or "units" of the Women's Land Army, hired by the day by different farmers in a locality.

Official figures on women workers during the war are lacking. In January, 1918, an estimate, based on a survey in 15 states by the Labor Department and the National League for Women's Service, set the number of women making war supplies at 1,266,000. With the exception of 100,000 munition makers, few were replacing men. Most were working in industries where women had long been employed, such as garment and shoe factories, textile mills and food preserving. In October it was estimated that the increase in the number of women workers since 1915 was 1,000,000, of whom 400,000 were in manufacturing and 500,000 in clerical positions.

Following the overturning of the Federal child-labor law (see *Court Decisions, infra*), Federal investigators reported from states having lower standards decided increases in the number of young children employed in mines, factories and canneries, and in the number of children between 14 and 16 working over eight hours a day. The active demand for labor and high wages paid also caused a larger number of children to leave school as soon as the law permitted. In St. Louis more children under 16 were reported to have obtained work permits in a single day than during the whole of 1917. In Massachusetts 25,000 children under 16 left school for work annually in normal years; in the year ending August, 1918, the number was said to be 50,000.

LABOR ORGANIZATIONS

Organized labor is generally credited with having greatly strengthened its ranks during the year. At the thirty-eighth annual convention of the American Federation of Labor, held at St. Paul, June 10-20, a paid-up membership of 2,726,478 was reported, which was a net increase of 355,044 over that of a year before. The Federation was made up of 45 state federations, 111 national and international trade and labor unions divided into 27,755 local unions, and 854 local unions and groups not otherwise affiliated. Of the 55 nationals and internationals making gains in membership, by far the largest increase was found among the United Mine Workers. The 32 organizations gaining over 1,000 members comprised the following:

American Federation of Labor locals	8,037
Blacksmiths	8,000
Bookbinders	2,533
Boot and Shoe Workers	1,898
Bridge and Structural Iron Workers	6,000
Railway Carmen	23,161
Carpenters	28,470
Railway Clerks	14,039
Electrical Workers	12,000
Federal Employees	8,000
Stationary Firemen	1,500
Foundry Employees	2,100
Fur Workers	2,172
Ladies' Garment Workers	7,000
Hatters	1,500
Hodcarriers	8,500
Iron and Steel Workers	5,000
Jewelry Workers	2,501
Leather Workers	3,000
Maintenance of Way Employees	5,169
Meat Cutters	33,152
Sheet-Metal Workers	1,000
Mine, Mill and Smelter Workers	1,000
United Mine Workers	367,966
Postal Employees	4,000

Printing Pressmen	2,266
Street Railway Employees	3,000
Railway Telegraphers	5,000
Textile Workers	10,566
Tobacco Workers	2,208
Typographical Union	1,887
Upholsterers	1,200

New nationals chartered during the year included the Railway Mail Association, National Window Glass Workers, and the International Association of Fire Fighters (made up of the employees of city fire departments).

Aside from matters dealing with the war, which claimed a large share of attention (see *Labor and War, supra*), some of the important resolutions at the annual convention of the Federation provided for an investigation of health insurance and the drafting of a model bill if approved, asked President Wilson to prevent Mooney's execution (see *infra*), favored a study of the steps by which the courts have gained their present power of declaring laws unconstitutional and the drafting of a bill to prevent usurpation of legislative power by the judiciary, and urged a campaign of organization in the steel industry. Reports from steel towns in the autumn indicated that this campaign was progressing, especially in the vicinity of Chicago. All the organizations concerned were working coöperatively, following a plan employed in the packing houses in the preceding year.

Women's Trade Union League.—The National Women's Trade Union League took active steps throughout the year to see that the interests of women war workers were protected, and that trade-union women were given representation on the various Government labor committees. A resolution of the Executive Board in September called for the appointment of two women on the National War Labor Board. An international conference of labor women at the close of the war was also projected.

The first conference of trade-union women ever called by the Government met in Washington on Oct. 4 and 5 for consultation with the Women in Industry Service of the Department of Labor. The conference, which included delegates from most of the unions having women members, was formed before adjournment into a permanent advisory committee to the Service. Resolutions adopted asked for a larger appropriation for the Service, for a minimum wage such as would cover the cost of living of a woman with dependents, for equal pay and equal opportunities for training in skilled trades for both sexes, for an actual working day of eight hours or less, for the principle of health insurance and for the prohibition of night work on war contracts, except in emergencies under careful safeguards.

Industrial Workers of the World.—During 1918 a large number of the leaders of the Industrial Workers of the World were convicted on charges of interference with the Government's war preparations. The principal trial was that of 101 men in Chicago, whose numbers included most of the principal officers of the organization. At the trial, which lasted over four months, the Government submitted a mass of documents to show that the defendants had conspired to hinder the war preparations of the United States and to obstruct recruiting. Ninety-seven men were convicted and given heavy sentences. On Sept. 4 a bomb explosion on the ground floor of the building in which the trial had been held killed four persons. The I. W. W. were suspected and several members were arrested. In February seven members of the I. W. W. were found guilty at Seattle of violating the Espionage Act by circulating false reports detrimental to the Government. In March United States troops were called in at St. Marie, Idaho, to prevent a mob from setting free an I. W. W. prisoner about to be sent to another locality for trial. On March 19 the Secretary of the I. W. W. at Yakima, Wash., was tarred and feathered and driven out of the town by a mob. On May 3 the police raided I. W. W. headquarters at Seattle and arrested 213 persons who were held for Federal investigation.

Report of President's Mediation Commission.—The president's mediation commission, sent by him to the Pacific coast in September, 1917, to investigate and compose the wide spread labor disputes in that region (*A. Y. B.*, 1917, p. 422), made public its report on Feb. 10. After detailing its work in settling strikes in the Arizona copper fields, California oil fields, the Pacific coast telephone service, the lumber industry of the Pacific Northwest, and the Chicago packing-houses, the commission stated that the factor common to all the unrest was the "lack of a healthy basis of relationship" between employers and employees, due to the employers' insistence on individual instead of collective bargaining. There was no machinery for the peaceful settlement of disputes, capital and labor were ignorant of each other's problems, and grievances went uncorrected. As remedies for the unrest, besides collective bargaining and machinery for settling disputes, the commission recommended the elimination of profiteering, the basic eight-hour day, unified national war-labor administration, removal of all restrictions on output, and more education of labor in war aims and Government methods.

Labor Cases.—The "Mooney case" (*A. Y. B.*, 1917, p. 424), involving the trial of persons prominent in the San Francisco labor movement for complicity in a bomb explosion during the 1916 preparedness parade, continued in the courts in 1918. In February the president's mediation commission declared unanimously for a new trial for Mooney on the ground that after his conviction a witness for the prosecution was found to have committed perjury. In March 2 the California Supreme Court denied Mooney a new trial, stating that it was powerless to take up matters not in the record at the original trial. Shortly thereafter the Court ordered the admission of two other defendants to bail. Two personal appeals by President Wilson for executive clemency toward Mooney produced no results. On July 27, after the date for Mooney's execution had been set for Aug. 23, the governor granted a reprieve until Dec. 13, saying that he would give careful consideration to the case in the interval. On Nov. 18. the U. S. Supreme Court declined to review the case. As the date of execution drew near, numerous threats of sympathetic strikes were made by labor organizations. The trial judge asked the governor for a new trial. Following charges by the director of the Federal Employment Service, a San Francisco grand jury began investigations on Nov. 25 into alleged irregularities in the administration of the district attorney who prosecuted the Mooney case. On Nov. 28 the governor commuted Mooney's sentence to life imprisonment.

As a result of the deportations from Bisbee, Ariz., in the summer of 1917 (*A. Y. B.*, 1917, p. 419), 20 prominent citizens were indicted in the Federal courts. The men, who included mine-company and city officials, were charged with conspiracy to deprive citizens of their legal rights and interference with the operations of the draft law. The indictments were quashed by the U. S. district court on Dec. 2, however.

In July the United Mine Workers were reported to be bringing suits aggregating $500,000 against mining companies in Allegheny County, Md., for wages claimed to have been withheld from them through incorrect scales used in weighing coal. The errors were discovered through inspection by the U. S. Bureau of Standards. Four companies had already been indicted and pleaded guilty to the charge.

In the later months of the year a considerable movement toward the formation of a separate labor party appeared in various sections of the country. The Chicago Central Labor Union called for such action and adopted a platform of 14 points which was later ratified by the Illinois Federation of Labor. Similar steps were taken by the city centrals of New York and Brooklyn, and a convention of their constituent local unions was planned for January, 1919, for further discussion. Movements of this kind were also reported in New England, Arizona, and the Pacific Northwest. The Executive Council of the Federation of Labor stated on Dec. 28 that it was not within the province of central bodies or state federations to become part of a national labor party.

Formation of Independent Labor Organizations.—Interesting illustrations of the spread of the collective-bargaining idea were provided by the formation by employers and by Government officials of employees' organizations to deal with working conditions. The Standard Oil Co. announced the inauguration of a system of "conferences" on working conditions with its employees beginning on April 1. The men were to elect representatives, one for each 150 employees, who were to confer at least once a month with company officials. Grievances of individual employees could be presented through these representatives, and committees on health, safety, sanitation, housing, and so on, were to be formed. Similar organizations were formed by the Midvale and Bethlehem Steel Companies. In the lumber industry of the Pacific Northwest, where labor disturbances had been prevalent in 1917 (*A. Y. B.*, 1917, p. 420), the army officer in charge of the production of spruce for airplanes (see XX, *Aeronautics*) formed the men, many of whom were members of the Industrial Workers of the World, into the "Loyal Legion of Loggers and Lumbermen." The officer's regulations for the industry included the basic eight-hour day without reduction of pay, time and a half for overtime, the six-day week, and clean camps. A convention of the "Loyal Legion" in March was made up of 461 delegates representing 62,000 men.

TRADE DISPUTES

The Strike Record.—Along with the development and activity of special Government agencies for settling disputes, 1918 has apparently witnessed a marked decrease in the number of strikes, as well as in their length and in the amount of disorder. The Bureau of Labor Statistics reported 1,771 strikes and lockouts in the first six months of 1918, in contrast to nearly 3,000 in the six months following America's entrance into the war. On May 1, a date frequently marked by the beginning of many disputes, not a single serious strike was going on. The secretary of the American Federation of Labor stated that there were 60 per cent. fewer strikes between January and May than during the same period in 1917.

Metal Trades.—Strikes by workmen in the metal trades involved, in almost every case, the supply of munitions of war. A strike of several thousand men at the Bethlehem Steel Co., Bethlehem, Pa., early in May resulted in an important award three months later by the National War Labor Board. The Board granted practically all the men's demands except those for certain wage increases. They were given the right to organize and to bargain collectively, the complicated bonus system was abolished, the basic eight-hour day was established, and representative committees to revise the piece-rate system and to interpret the award and adjust future differences were organized. Piece rates were not to be cut during the war. Pending the Board's decision, the men had returned to work. With the cessation of hostilities the Company announced that the power of the Board had ceased and that it intended to substitute its own system of collective bargaining for the Board's. The statement caused a sharp rejoinder from the chairmen of the Board.

In the spring several thousand machinists and tool makers in Bridgeport, Conn., struck for wage advances. A committee from the Ordnance Bureau made various awards, which the manufacturers did not put into effect, claiming that practical application was impossible. On June 27 nearly 10,000 skilled machinists and tool makers went on strike to force the awards into effect. Another grievance was an alleged "blacklist" of union members maintained by the manufacturers of the city. The case was taken up by the National War Labor Board. On July 5, 53 firms employing 50,000 workers agreed to accept the Board's award, fearing further unrest if it covered only those plants whose employees had struck. As the Board was unable to reach a unanimous decision, the case was left to an arbitrator. His rulings, announced on Sept. 4, gave wage increases to all receiving less than 78 cents an hour, and established a minimum wage of 42 cents an hour for men and 38 cents for women. The right to organize and join unions was affirmed. The employees had asked for a reclassification of all workers from numerous grades into four with four rates of pay; this was denied.

Dissatisfied with the award, one lodge of the Machinists' Union almost immediately went on strike. On Sept. 14 President Wilson wrote to the strikers, asking them to return to work and to abide by the award. If they refused, they would be barred from employment in war industries in the community for one year, during which time the U. S. Employment Service would refuse to find them work in war industries elsewhere, and the draft boards would refuse them deferred classification on industrial grounds. The men voted to go back to work, but the manufacturers refused to reinstate them. On Sept. 17 the President wrote to the employers that in view of the machinists' prompt compliance with his directions, he must insist on the reinstatement of all of them.

Refusal by employers to accept an award of the National War Labor Board led to commandeering of their plant when workers of a revolver factory in Springfield, Mass., struck on July 12 for higher wages, improved working conditions, and the reëmployment of several men discharged for trade-union membership. The award of the War Labor Board recommended the establishment of a system of collective bargaining by elected shop committees and the discontinuance during the war of the firm's individual contracts which bound men not to join unions. The elimination of individual anti-union contracts was also a part of the awards of the War Labor Board, following a strike in the plant of the General Electric Co. at Lynn, and a threatened strike at Pittsfield, Mass.

Another important award of the Board in a machinists' strike at Waynesboro, Pa., established a minimum wage of 40 cents an hour for common laborers, more than the men had asked for, because the Board believed it the smallest amount permitting "the worker and his family to subsist in health and reasonable comfort."

A strike of several thousand metal workers in and about Newark, N. J., for higher wages began on July 17. It was ended on July 20 through the arbitration of an Ordnance Bureau officer. Higher rates were granted, and it was provided that after six months readjustments might be made whenever there was a 10 per cent. increase in the cost of living. Strikes of over 30,000 workers in the General Electric Co., five plants at Lynn, Pittsfield, Schenectady, Erie, Pa., and Fort Wayne, Ind., began late in December.

Shipbuilding.—The only important strikes in shipbuilding yards in 1918 took place among ship carpenters on the Atlantic coast in February, apparently in the beginning to hasten a pending wage decision of the Shipbuilding Labor Adjustment Board (*A. Y. B.*, 1917, p. 421) and to obtain the Pacific-coast scale of pay. The strike began with 300 men in Baltimore on Feb. 11, followed the next day by 800 at Staten Island, New York. On Feb. 14 the chairman of the Shipping Board urged the men not to add to the perils of the army in France by delaying shipbuilding. A letter from Staten Island strikers to President Wilson on the same day gave the recruiting campaign for shipyard workers and the alleged unequal distribution of skilled labor between the yards as additional grievances besides the wage scale. On Feb. 16 the Adjustment Board's award for the Delaware River and Baltimore district (see *Mediation and Conciliation, infra*) was announced and 6,000 men in 40 New York shipyards went on strike because, it is claimed, the Board's awards did not grant a closed shop. On Feb. 17 President Wilson sent a sharp letter to the head of the carpenters' union, asking him whether he intended "to coöperate or to obstruct," and refusing to see him as the man had wished until his union, like the others in the shipbuilding trades, agreed to abide by the decisions of the Adjustment Board. By Feb. 19 the strikers were reported returning to work, and the president of their union was in conference with the Adjustment Board. On Feb. 20 he yielded to the Board on the question of the "closed shop."

General Strikes. — On March 6 strikes began in St. Louis in seven department stores, in a large electrical-appliance factory, and in three chemical factories. Others followed until 15 firms were affected, involving delay on large quantities of war supplies. To settle the disputes the National War Labor Board organized its first permanent local board of mediation and conciliation. A general strike was called in Kansas City on March 27 in support of laundry workers who had been on strike for several weeks. On March 29 serious rioting, in which several rioters were injured, one fatally, followed an attempt to resume street-car service. The riots were suppressed by police and National Guard. The strike was settled by conciliators from the Federal Department of Labor.

Street Railways.—Numerous strikes of street-car men took place in 1918, most of which were taken up by the National War Labor Board after a few days' cessation of work. Strikes covered by a settlement of the Board announced on Aug. 8 included Cleveland, Columbus, Detroit, Albany and vicinity, Rochester and Buffalo. The award raised wages from 35 to 40 per cent. in large cities and as much as 65 per cent. in some small towns. A minimum of 48-50½ cents an hour was established for carmen in the larger cities, 45 cents in smaller towns, and 42 cents in rural communities. The right to organize and to wear union buttons was upheld. The raising of fares when necessary to cover these increases was urged. The Buffalo award was conditioned on the maintenance of an increase in fares recently granted by the City Council. This was overturned by popular vote, and the men went on strike again. The second strike was ended by an arrangement through which higher fares were to be allowed and the city was to name a manager and a majority of the board of directors of the railroad. Street-car service was completely suspended between Feb. 2 and 8 in St. Louis because of a strike. The main issues were the right to organize and to negotiate collectively with the management. These demands, together with a 10 per cent. raise in wages, were granted by the War Labor Board. In the autumn a dispute arose over the discharge of 29 elevated railway motormen in Brooklyn for membership in the Brotherhood of Locomotive Engineers The War Labor Board ordered their reinstatement but the Brooklyn Rapid Transit Co. refused to comply. On Nov. 1 the motormen went on strike. That evening an elevated train, put in charge of a train dispatcher because of lack of experienced men, was derailed and 89 passengers were killed. Late the same night the company yielded to the men's demands.

Miscellaneous.—A protracted strike of cloth weavers employed on Government contracts in 50 Philadelphia mills which lasted 21 weeks was ended on Feb. 20 through efforts of the Quartermaster's Department. Workers in paper mills in Maine and northern New York called a strike for May 1 to secure higher wages. The War Labor Board intervened and succeeded on April 30 in getting the men to remain at work pending the Board's award. A 20 per cent. wage increase and a basic eight-hour day were among changes granted on June 29. The companies then ceased to pay the 10 per cent. war bonus formerly in effect. On July 27 the men struck to force continuance of the bonus. An interpretation of the War Labor Board's award made a few days later ordered the bonus continued until notice of its abandonment was given and forbade reduction in wages because of reduction in hours; this ended the dispute. In July Brockton shoe cutters broke away from the Boot and Shoe Workers' Union, formed an independent organization, and went on strike. Difficulty was experienced in settling the dispute because the manufacturers were under contract to employ only members of the Shoe Workers' Union. Following the signing of the armistice and the cessation of overtime on Government construction work, employees in Brooklyn and in Norfolk, Va., navy yards stopped work for a few days, saying they could not keep up the payments on their Liberty Bonds without overtime pay.

MEDIATION AND CONCILIATION

Federal Adjustment Agencies.—The two chief Federal agencies settling trade disputes in 1918 were the commissioners of conciliation under the Secretary of Labor and the National

War Labor Board. Between Jan. 15 and Oct. 16 the former intervened in 1,470 actual or threatened strikes and lockouts. The War Labor Board reported that from April to November 673 cases had been filed with it; awards had been made in 358 disputes, and 351 were awaiting settlement. The Board had also dropped 50 cases, mostly because of failure of the parties to appear, had refused to take up 17, and had referred 177 to other Government departments. Four disputes were withdrawn, and 33 settled without the assistance of the Board.

Western Union Telegraph Company.—A dispute on the question of union membership between management and employees of the Western Union Telegraph Co. attracted much public attention, and led to the taking over of the telegraph lines by the Government after the company had declined to accept the verdict of the National War Labor Board. On April 21 the commercial-telegraphers' organization made public an announcement that they would go on strike a week later unless several hundred men discharged for union membership by the Western Union were reinstated. The War Labor Board intervened and on May 1 asked both the Western Union and the Postal Telegraph Co. to cease discharging union members pending its decision. The Western Union refused, stating it understood that the Board's principle of non-interference with union membership applied only to occupations in which union men had always been employed (see "Labor Standards," *supra*). The union agreed to defer its strike pending the Board's decision. The decision of the Board, announced on June 1, maintained that the men had a right to join the union and should be reinstated if discharged for this reason. The company need not deal with the union or recognize it, but should allow committees of employees to present grievances. All questions on which agreement could not be reached should be settled by the Board. The telegraphers' union should present all its grievances to the War Labor Board in place of striking. The president of the Western Union refused to accept this award, proposing instead a referendum of the employees on two points, whether they wished to be members of the commercial telegraphers' union and whether they wished to join an organization composed entirely of Western Union employees, committed to a "no strike" policy, and submitting all grievances to the War Labor Board for arbitration. The Board rejected this proposal by a five to four vote on the ground that employees must be free to join the unions of their choice. On June 11 President Wilson wrote to the heads of the two companies, urging that it was "imperatively necessary in the national interest" for all parties concerned to accept the decisions of the National War Labor Board. The president of the Postal Telegraph Co. yielded to the President's request, but the attitude of the president of the Western Union remained unchanged. The telegraphers then called a strike for July 8. On July 1 President Wilson asked Congress to authorize Government control and operation of telegraph and telephone lines. The legislation was passed on July 15 (see also I, *The Sixty-fifth Congress, Second Session*), and all telegraph and telephone systems were taken over by the Government at midnight of the 31st (see also XIX, *Telegraphs and Telephones*). Pending Congressional and administrative action, the telegraphers strike had been deferred.

Adjustment of Controversy of Packing-house Employees.—An important trade agreement covering the meat-packing industry in the Middle West was reached in 1918. Late in 1917 the President's mediation commission had averted a strike in the industry by establishing the principle of collective bargaining and appointing an arbitrator to settle disputed questions regarding working conditions (*A. Y. B.*, 1917, p. 422). A number of the points at issue, however, were decided by an agreement between employers and employees reached on Jan. 23. The agreement guarded against "unjust dismissal". Employment for 30 days was *prima facie* proof of competence, and cause must be shown for all discharges after that time. Employees were not to be dismissed for trade-union membership or activities, and were to be allowed leaves of absence to attend conventions. All promotions below the grade of foreman were to be governed by the principle of seniority. No discrimination on grounds of race, color or nationality was to be made. Employees were not to be required to join sick- or death-benefit associations. Proper dressing rooms, lunch rooms, wash rooms and toilets were to be provided. All piece-rate schedules were to be posted, together with copies of the agreement. The decision of the arbitrator, which covered mainly wages and hours, was made on March 24, after hearings and personal investigation of the living conditions of packing-house employees which gained considerable publicity. The basic eight-hour day was granted, the same rates of pay for both sexes, and wage increases of 4½ cents an hour for those receiving less than 30 cents, four cents for those paid between 30 and 40 cents, and 3½ cents for the more highly paid.

Marine Workers.—Peaceful adjustments of wage disputes were made during the year for several classes of sailors and water-front workers. In April harbor workers in New York threatened to strike to secure higher wages. The organizations involved included tidewater boatmen, lighter captains, and hoisting and marine engineers. The controversy was taken up by the National Adjustment Commission of the Shipping Board (*A. Y. B.*, 1917, p. 422) and an increase in pay given under an agreement holding if conditions remained unchanged for one year from June 1. In October this group of workers again asked for higher pay. At the expiration of their working agreement on Oct. 1 the Adjustment Commission awarded the 45,000 longshoremen in Atlantic ports higher overtime rates and an eight-hour day.

Following conferences between the Shipping Board, owners of vessels, licensed officers and representatives of seamen, a new wage scale for Atlantic shipping was adopted on May 4. The rates varied from $40 a month for boys and $55 for ordinary seamen to $65 for coal passers, $75 for able seamen and $85 for boatswains. A 50 per cent. bonus was paid for all voyages in the war zone. More difficulty was experienced in reaching an agreement on working conditions among seamen on the Great Lakes, and a strike, called for July 29, was narrowly averted. The chief question involved was the willingness of the employers' federation, the Lake Carriers' Association, to join with the union in recruiting sailors. On July 28 the Association was ordered by the Shipping Board to join in the appeal. The Association's "welfare plan", which involved a record book carried by each seamen, had previously been abolished by the Board. It was claimed that this caused discrimination against members of the union.

Shipyards.—Following disputes in the fall of 1917, the Shipbuilding Labor Adjustment Board made several awards covering the Atlantic coast during the early months of 1918 (*A. Y. B.*, 1917, pp. 418 and 421). The first award, applying to the Delaware River and Baltimore district, was made on Feb. 14. It established a basic 44-hour week, with overtime up to a maximum of 60 hours, except in extraordinary emergencies. Notices were to be posted, saying that piece rates were not to be cut during the war, and urging the removal of all restrictions on output. The rates fixed approximated 40 cents an hour for unskilled laborers and 46 cents for helpers. Skilled mechanics of various kinds were awarded over 70 cents an hour in most cases, as much as $1.35 being paid "heavy hammer forgers." An award covering shipyards in the South Atlantic and Gulf states, with somewhat lower wage rates, was announced on March 4. But on April 6 an award primarily for North Atlantic and Hudson River shipyards, in order to check the shifting of labor between different sections, established the same rates for skilled mechanics over the entire Atlantic coast. These rates were practically those of the Delaware River award, except that for common labor the rate was 49 cents an hour. Other important clauses provided for shop committees to take up grievances, for sanitary regulations, for a weekly pay day, and against any compulsory private insurance assessments. A similar award for Great Lakes shipyards was made soon after. During the spring wage schedules similar to those in the shipyards were also established for civil employees in the navy yards on both the Atlantic and Pacific coasts by agreement between the Navy Department and union officials. Owing to increases in the cost of living, the Adjustment Board announced further changes in wage scales throughout the country on Oct. 27. A basic minimum rate of 80 cents an hour in skilled trades was established, and increases averaging 15 per cent. on the eastern coast and Great Lakes and 20 per cent. on the western coast were given men earning over $5.25 a day. For the lower-paid workers larger increases were provided.

Railway Shopmen.—In February, to meet emergency demands in repairing locomotives and other equipment, an interesting agreement was effected between the unions representing railway shopmen and the Federal Railroad Administration. All shops working a single shift less than 70 hours a week were to increase hours, preferably on a seven-day basis. Apprentices who had served three years and helpers who had served five years might be promoted to mechanics' positions for the duration of the war. Mechanics were not to be denied positions for any ground other than inability to perform the work.

COURT DECISIONS

Child Labor.—The most important court decision on labor matters in 1918 was probably that in which the U. S. Supreme Court, by a five to four vote, declared the Federal child-labor law unconstitutional (Hammer *v.* Dagenhart, 247 U. S. 251, June 3, 1918). The law forbade shipment in interstate commerce of certain goods in the making of which children under 14 were employed at all, or children under 16 at night or more than eight hours a day. The test case involved a North Carolina cotton-mill employee, for whom an injunction was asked because the law caused him to lose the entire wages of one son through preventing his employment, and part of the wages of another through reduction in hours. A Federal district judge had granted an injunction in 1917, which was appealed to the Supreme Court (*A. Y. B.*, 1917, p. 426). The majority opinion of the latter court held that the law was not a regulation of commerce, but an attempt to regulate conditions and methods of manufacture, so that it was not within the powers delegated to Congress by the constitution. In other cases (lotteries, impure food, etc.) where Congress had forbidden the interstate transportation of certain articles, the interstate commerce was necessary to the accomplishment of the harmful results, whereas in the present case there was no intrinsic evil in the goods themselves. The enactment of the law violated the Tenth Amendment, as it was an attempted usurpation by Congress of powers reserved to the states. Its enforcement would cause a deprivation of liberty and property without due process of law, which was a violation of the Fifth Amendment. The dissenting opinion, by four justices, took the position that the power of Congress to regulate commerce was unqualified and included the power to prohibit, if Congress felt that the national welfare demanded this. The decision apparently prevents any regulation of labor conditions by the Federal Government through its commerce power under present conditions. The limitation of women's working hours by this method had been under discussion. (See also VIII, *Law and Jurisprudence;* and XIV, *Child Welfare.*)

Alaska Eight-hour Law Declared Unconstitutional.—An Alaska law which limited the working day to eight hours for all employees except in certain emergencies was declared unconstitutional (U. S. *v.* Northern Commercial Co. and George A. Coleman, March 23, 1918). The judge held that the statute, applying as it did to all occupations alike, was not shown to be a health measure, but was a "meddlesome interference" with individual rights. By interfering with the right to earn a living which is a property right, it violated the Fourteenth Amendment to the Federal Constitution. In addition, it was class legislation, which was forbidden by the organic act creating the territory. On similar grounds the Solicitor-General of the United States declined to allow the case to be appealed to a higher court.

Minnesota Anti-Sabotage Law Upheld.—The constitutionality of a Minnesota law forbidding "criminal syndicalism" was affirmed (State *v.* Moilen, 167 N. W. 345, April 19, 1918). The offence was defined by the statute as using various "unlawful methods of terrorism as a means of accomplishing industrial or political ends." It was charged that the act violated the Fourteenth Amendment, that it was class legislation, and that the penalty imposed, of imprisonment for not more than 10 years and a fine not exceeding $5,000 or both, constituted "cruel and unusual punishment." The court dismissed the contention that it violated constitutional rights as "without special merit." The claim that the law was class legislation because it related only to employers and employees was not strictly true, but even if it were, other laws dealing exclusively with the relation have been upheld as valid. The penalties did not "exceed the limits of legislative discretion."

Injunction against all Strikes in War Plants.—On Oct. 7 a justice of the New York Supreme Court issued an injunction forbidding all strikes for the duration of the war in a New York City shoe factory engaged mainly in war work. He stated that in his judgment principles applicable before the war did not apply. His reasons for the injunction were that a strike in a war industry might endanger the success of military operations by interrupting production necessary to the war, and that the Government had set up machinery for the settlement of grievances by peaceful methods. A similar injunction against a strike by grocery clerks was issued by the U. S. District Court of the Eastern District of Missouri, partly on the ground that it would cause the loss of large amounts of food products, contrary to the food conservation law (Kroger Grocery & Baking Co. *v.* Retail Clerks' International Protective Ass'n *et al.*, 250 Fed. 890).

The Seamen's Act.—On Dec. 23 the U. S. Supreme Court, in its first interpretation of the Seamen's Act, upheld the section requiring the payment, on demand, of half a seamen's wages, on his arrival in an American port.

SOCIAL WELFARE

Social Insurance.—The system of compensation and insurance for soldiers and sailors and allowances for their dependents, established in 1917 (*A. Y. B.*, 1917, pp. 354, 427), developed to tremendous proportions in 1918. In November voluntary life insurance amounting to nearly $37,000,000,000 had been taken out by over 4,000,000 soldiers and sailors. The average policy was about $9,000, $10,000 being the maximum allowed. It is said that the total amount of life insurance carried by commercial and fraternal companies is but $34,000,000,000. The War Risk Insurance Bureau, which administered the insurance, had 13,000 employees and was mailing about 1,000,000 checks to soldiers' dependents monthly. Complaints made in Congress about delays in payments resulted in an investigation and a statement that most of the delays were due to faulty addresses, or failure by officers to forward their men's applications. After the signing of the armistice the Government made a special appeal to the men to urge them to keep up this voluntary Government life insurance. (See also XIII, *Life Insurance.*)

The seamen's division of the War Risk Insurance Bureau, which provided compulsory insurance for all seamen crossing the war zone and voluntary insurance for others, reported in May, at the close of its first year's work, that more than 69,000 officers and men were insured, their policies aggregating $115,000,000, and that about $180,000 in claims had been paid.

The Red Cross followed the example of the Government and provided life, health, and accident insurance for all its workers abroad who did not come under the Government plan. A thousand dollars of insurance was provided without medical examination, payable at death or after two years of total permanent disability. For certain specified permanent injuries, $500 additional would be given. The Red Cross also offered to pay the additional war-risk premium up to $25 a $1,000 on a maximum of $5,000 life insurance taken out by its workers in commercial companies. A weekly indemnity of $20 a week for 100 weeks would be paid in case of disability from sickness or injury, with medical care for the first four weeks.

In the field of workmen's compensation, the probability of a large number of disabled soldiers caused the problems of the cripple to become prominent. One important question concerned the man who, because of a previously existing disability, was totally incapacitated through a second injury, perhaps in itself comparatively small. Unless special provision is made, employers are reluctant to assume the compensation risks involved in hiring such men. Only New York and Ohio have dealt justly with this class by limiting their employers' liability to the second injury, and paying for other results out of special funds. The failure of the U. S. Government to make such arrangements in connection with its soldiers' and sailors' insurance may handicap disabled soldiers in finding employment.

Up to November, 1918, Massachusetts was the only state providing for the vocational training of industrial cripples in connection with its compensation law (see also *Labor Legislation, infra*). The United States has developed a comprehensive system for military cripples (see XIV, *Vocational Education*). The American Association for Labor Legislation has coöperated with other interested organizations in urging the passage of a bill, on which hearings were held in December, which would utilize the machinery for military cripples for the rehabilitation of industrial cripples. Its terms empower the Federal Board of Vocational Education to arrange with the states for vocational rehabilitation and placement of maimed industrial workers, and for a Federal subsidy equal to the state expenditures.

Health Insurance.—The progress of the health-insurance movement may be gauged by the fact that eight state legislative commissions were investigating the subject in 1918. Increased support of compulsory health insurance by labor was manifest. For instance, the New York State Federation of Labor placed health insurance first among the legislative proposals on which it questioned all state candidates before the 1918 election. In an inconclusive report in February, 1918, a majority of the Massachusetts Commission on Social Insurance advocated "sickness prevention" without a very definite explanation of methods; a minority favored universal health insurance. A proposed social-insurance amendment to the California constitution was defeated in November. Its principal opponents were Christian Scientists and the commercial insurance companies.

Safety, Health and Comfort.—War conditions undoubtedly gave impetus to the industrial-safety movement in 1918. Increased pressure of work and a larger proportion of inexperienced employees caused a greater number of accidents, while the scarcity of help accentuated the need for human conservation through accident prevention. The seventh annual Safety Congress, meeting at St. Louis in September, had more than 1,000 delegates in attendance, representing 3,600 large corporations with over 6,000,000 workers. Besides the various sections on different types of industries, the Congress included divisions on transportation and public service, health and industrial relations, public administration, and public safety. Among the topics discussed at the national and at the various state safety congresses which reflected changes due to the war were the safety of women in industry and the vocational reeducation of crippled workers (see also XIV, *Vocational Education*). The latter subject was taken up also at the twelfth annual meeting of the American Association for Labor Legislation which was opened at Richmond, Va., Dec. 27. The possible inclusion of international minimum standards of safety, health, and comfort in the peace treaty was another topic discussed at this meeting.

In connection with its war-time control of industry the Federal Government gave attention to stimulating not only the safety movement, but also provisions for the health and comfort of employees. In February the Railroad Administration established a safety section to exercise centralized supervision over local railroad safety work. At about the same time the U. S. Public Health Service took steps to guard the health of munition workers against trinitrotuluol and other dangerous poisons used in the manufacture of explosives (see also XXV, *Public Health*). An order from the War Department in October required all ordnance plants to admit inspectors from the service. Elaborate health, safety and welfare programmes were developed in connection with Government shipyards and munitions plants, including medical aid, physical examination of all applicants for employment, proper sewage and water supply, sanitary living conditions, and mosquito-prevention work. A Department of Health and Sanitation was organized in the Shipping Board, which required private shipyards to maintain a medical service for their employees and to encourage the formation of recreational clubs. The Department gave attention to sanitary conditions in towns containing shipyards, and secured improvements in several localities.

By the summer of 1918 the Government was making provisions for the health and comfort of the army of clerks in its employ in Washington. Such provisions were most extensively developed in the War Department under a special division on health and housing. Each bureau maintained an emergency room and a visiting nurse who looked up absentees. The division arranged a series of lectures on health for the War Department's employees, secured the opening of public schools for evening recreation, and encouraged the formation of clubs for education and recreation. In the spring the division was active in organizing a Government Recreation League which covered all departments, and which began in May a survey of the District's recreation facilities and registration of employees' preferences in recreation.

Hours of Labor.—In spite of the pressure of work caused by the war, the eight-hour day principle made decided progress in 1918. During the first six months of the year the U. S. Bureau of Labor Statistics reported that 330,000 employees gained the eight-hour day, the total number affected since 1915 being estimated at 1,448,000. Important industries which inaugurated an eight-hour day policy in the earlier months of 1918 included many steel plants, the lumber industry of the Pacific Northwest, news-print paper mills, shipyards, and meat-packing houses.

In most of these cases the change was due to the influence of the Government or to the rulings of such Government boards for the settlement of disputes as the Shipbuilding Labor Adjustment Board and the National War Labor Board, most of whose awards established the basic eight-hour day, with additional pay for all overtime (see *Labor Disputes* and *Mediation and Conciliation, supra*). A decision by an umpire for the War Labor Board, announced on Sept. 18, which set up the straight eight-hour day, except in emergencies, in a foundry in Wheeling, W. Va., received much attention. The umpire pronounced in favor of a shortened work-day because of the existence of a "vast body of experience" that longer hours shortened the workers' lives, injured their health, and in the long run decreased production. Overtime was to be permitted only by the vote of a joint committee of employers and employees.

The report of the commission appointed in 1916 (*A. Y. B.*, 1916, p. 549) to study the operation of the Adamson law, fixing a basic eight-hour day for railroad trainmen, was made public early in 1918. The conclusions of the commission did not entirely bear out either those who held that the law was simply a device for raising wages or those who believed it a real hour measure. The greatest reduction in hours was among yard crews, 11,000 of whom were placed on eight-hour shifts between March and October, 1917. Passenger trainmen, who were already often working eight hours or less, were little affected, while freight crews continued to have runs of from 11 to 13 hours. Among 69,000 of the 308,000 employees coming under the law, 12.6 per cent. received no increase as a result in January, 1917; 30 per cent., less than $10 a month; 22 per cent., from $10 to $20; and 23 per cent.,

$20 to $30. The increases were chiefly in overtime payments. Returns from a limited number of roads indicated that they were paying out about 15 per cent. more in wages.

On the day following the signing of the armistice, the heads of the Government's three chief production departments, War Department, Navy Department, and Shipping Board, decided to issue an immediate order to discontinue overtime and Sunday work on all Government construction, and in all Government-owned or -controlled plants and establishments producing war supplies. An order by the Federal Director of Railroads, dated Nov. 22, ordered that wherever practicable daily hours in all locomotive and car shops, increased by agreement in the spring to meet the emergency (see *Labor and War, supra*), should be reduced to nine on Nov. 25 and eight on Dec. 9. Because of the alleged practice of laying off a day or two during the week and then working on Sunday in order to draw the higher overtime rate in force on that day, four awards of the national War Labor Board, made on Oct. 9 and 11, refused any overtime allowance unless the employee had worked at least 48 hours during the week.

Wages. — Under the Government's war-time control of industry, in addition to the wage increases granted as a result of industrial disputes (see *Trade Disputes* and *Mediation and Conciliation, supra*) certain adjustments of wages were made on a very large scale. The U. S. Railroad Administration early in 1918 appointed a Railway Wage Commission to work out a "fair" basis of wages. The Commission, after extended studies of the existing wage level and changes in the cost of living, made its report on April 30. It found that 51 per cent. of railroad employees received $75 a month or less; 80 per cent., $100 or less; and only 3 per cent. (except officials), as much as $150 to $250 monthly. The Commission recommended a graduated set of increases covering the full increase in the cost of living for low-paid workers and a lesser amount for the higher grades, who might be expected to spend a smaller proportion of their incomes for necessaries and to have a greater chance to economize. The increases recommended varied from 43 per cent. for those receiving less than $50 a month to one per cent. for those paid $248 to $250, and were to be retroactive to Jan. 1. Equal pay for equal work was provided, regardless of sex or color. The recommended increases were put into effect by the Director-General, except that an additional 2½ cents an hour was granted common laborers. Later wage awards supplemented the first orders for important groups. An order of July 25, whose aim was said to be the removal of inequalities and stabilization of wages, affected nearly 1,000,000 employees. Railroad shop mechanics were divided into seven classes, with basic minimum wages of 68 cents an hour for the more skilled and 58 cents for the less skilled, in place of 55 cents. Clerks, station employees, common laborers in railroad shops, and maintenance of way employees received an increase of $25 a month, or 12 cents an hour over their wages prior to Jan. 1. On Nov. 16 railroad telegraphers were given an increase of 13 cents an hour, with a minimum of 42 cents on similar terms. A supplementary order of Nov. 25 gave 2,500 station agents a minimum wage of $95 a month and an increase of $25. All awards were based on an eight-hour day standard, with pay for any overtime. (See also XII, *Economic Conditions;* and XIX, *Railroads.*)

The War Labor Policies Board (see *Labor and War, supra*) devoted much of its attention to the problem of standardizing wages on war work, so that an industry might have equivalent wage scales throughout the country and so that similar standards might prevail between different industries. The aim of the Board was to stop competitive bidding of contractors for labor and the resulting high turnover. A resolution of the Board passed on June 14 asking the various Government boards and departments to refrain from making wage changes pending standardization aroused considerable comment. In answer to an inquiry from the National War Labor Board, the Policies Board stated that this was not intended to nullify the former's decisions nor to check the raising of substandard wages. Through the summer the Board consulted with employers and employees representing the building and metal trades. Its principal ruling, however, up to the time of signing the armistice, covered anthracite-coal mining. An increased wage scale of from 42 cents an hour for common labor to $6.60 a day for contract miners was put into effect in order to stop shifting to other war industries.

By a resolution passed on July 31 the National War Labor Board declined to set a general minimum wage to carry its living-wage standard into effect (see *Labor and War, supra*) until it had a sufficient number of decisions on individual cases to afford a firm basis for generalization.

In April a number of noteworthy wage increases were made by private companies. These included a 10 per cent. increase for employees of the Standard Oil Co., a 15 per cent. increase for the 200,000 employees of the U. S. Steel Corporation and 10 per cent. for the miners on the iron range in northern Minnesota. Congress voted an increase of $120 a year, provided it did not exceed 30 per cent. of wages, to all District of Columbia employees receiving less than $2,000 annually.

An index of the general movement of wages in manufacturing is afforded by figures gathered by the Bureau of Statistics of the New York Industrial Commission, covering about a third of the factory employees of the state. The Bureau gave the average weekly wage in September, 1918, as $22.31, an increase of 80 per cent. in four years, 50 per cent. in two years, and 31 per cent. in 12 months.

Considerable discussion on the course of wages after the war was precipitated by an attack on the wartime rise in wages by the president of the National Founders' Association, who declared that the existing scale must drop if the nation's needs were to be met. A spirited reply by Samuel Gompers, president of the American Federation of Labor, stated that labor would insist on holding to any war-time advantages it had gained.

Cost of Living. — In considering wage increases it must be remembered that although the cost of living had reached abnormal heights in 1917 (*A. Y. B.*, 1917, p. 429) still further advances were recorded in 1918. During the four-year period ending September, 1918, in which New York factory workers' wages rose 80 per cent., retail food prices increased 67 per cent. The increase in these food prices in a single year was 16 per cent., and in two years 31 per cent.

Over the period from 1914 to August, 1918, the U. S. Bureau of Labor Statistics gave the variations in retail food prices as follows, 1913 being taken as 100 per cent.:

		1918:	
1914	101.5	Jan. 15	160
1915	100.0	Feb. 15	161
1916	112.4	March 15	154
1917	145.0	April 15	154
1918 (9 mo.)	162.7	May 15	158
		June 15	162
		July 15	167
		Aug. 15	171
		Sept. 15	178

The *New York Times* index number of wholesale food prices, based on the average price during the decade 1890-1899, is, for similar periods:

		1918:	
1914	146	Jan.	280
1915	148	Feb.	286
1916	175	March	287
1917	261	April	289
1918	287	May	286
		June	281
		July	284
		Aug.	290
		Sept.	293
		Oct.	286
		Nov.	286
		Dec.	291

But apparently in 1918 certain other commodities rose in price even more rapidly than food. The U. S. Bureau of Labor Statistics gives the rise in the wholesale price of clothing as 20 per cent. between January and August, 1918, whereas the change in wholesale food prices was only 2.1 per cent. According to a cost-of-living study among several hundred shipworkers' families along the North Atlantic coast, clothing costs rose 51 to 111 per cent. in different localities between December, 1917, and the following August, and food from eight to 56 per cent.

But owing to the sharp advances in food prices in 1916 and early 1917, the total increase in food costs since the outbreak of the European War has undoubtedly been high in comparison with some of the other items of a family budget. The National Industrial Conference Board, which studies labor problems for a number of large manufacturers' associations, gives the percentages of rise in the main items of living expense between July, 1914, and November, 1918, as follows: food 83; rent 20; clothing 93; fuel and light 55; sundries 55. Advances in rent were reported to be very irregular, running as high as 80 to 100 per cent. in the crowded centers of war industry.

Among the shipbuilders' families, percentage increases in price for the various classes of living costs were reported to vary as follows between December, 1915, and August, 1918: clothing, 85-111; furniture and furnishings, 98-116; food, 61-83; housing, 2-34; fuel and light, 25-56; miscellaneous, 62-80.

Allowing for the varying importance of different items of expenditure, the Conference Board put the total increase in cost of living at 65 to 70 per cent. between July, 1914, and November, 1918. For the shipbuilders' families it was stated to be 62 to 80 per cent. between December, 1915, and August, 1918. A committee of the Bankers' Trust Co. in New York City found that among the bank's employees, who were mainly clerical workers, the cost of living had risen 47.5 to 51.8 per cent. between June, 1914, and January, 1918. The U. S. Railway Wage Commission stated that in order to maintain the same standard of living, a family with a yearly income of less than $600 would require 40 per cent. more on January 1, 1918, than two years before; one with an income of $600 to $1,000, 38 per cent. more; and one with $1,000 to $2,000, 37 per cent. more. (See also XII, *Economic Conditions.*)

IMMIGRATION

Immigration.—The number of immigrant aliens admitted to the country during the fiscal year ending June 30, 1918, was the smallest since the war checked the tide of immigration and only a small fraction of the throngs entering before the war. Only 110,618 immigrant aliens were admitted in the year ending June 30, 1918, and 295,403 in the same period in 1917, in contrast to 1,403,081 in the year ending June 30, 1914. The countries contributing the largest number of immigrants during the year were England, Japan and Mexico. The number of immigrants belonging to each nationality of which more than 4,000 entered the country during the fiscal year 1918 was as follows:

African (black)	5,706	Japanese	10,168
English	12,980	Mexican	17,602
French	6,840	Scotch	5,204
Irish	4,657	Scandinavian	8,741
Italian	6,308	Spanish	7,909

In order to help in meeting the shortage of labor caused by the war, on April 12 the Secretary of Labor set aside clauses of the immigration law relating to the literacy test, the head tax, and the contract-labor prohibition to allow the admission of farm laborers from Mexico, the West Indies and Canada for periods of not more than six months. Every employer was required to pay the current rate of wages, to observe legal standards for housing and labor conditions, and to deposit monthly deductions from the immigrants' wages in a postal savings bank, to be paid the immigrant on his return. Later orders extended these rulings to Mexicans hired for railroad track maintenance, all forms of mining, and construction work for the U. S. Government. The provisions regarding compulsory saving were dropped. On Dec. 26 the ending of such permits was announced.

An indication that many aliens would return home for at least a time after the conclusion of peace was shown by the fact that immediately following the signing of the armistice large numbers of foreigners thronged New York steamship offices, seeking to buy passage on the first ships leaving port. Most of them said they wished to learn the fate of relatives, from whom they had not heard since the war. They were unable to leave, however, as war restrictions on travel were still continued in force.

LABOR LEGISLATION

IRENE OSGOOD ANDREWS

Labor Laws in War Time.—Labor legislation during the second year of our participation in the world war showed that protective labor standards had won recognition as a sound basis on which to maintain and increase the fitness and efficiency of the country's industrial army. Despite scattering attempts to suspend measures for the protection of industrial workers, Congress and the 22 states and territories which held legislative sessions in 1918 almost unanimously insisted on upholding, enforcing, and extending labor laws. Outstanding features are the Congressional Act establishing a Minimum Wage Board for women in the District of Columbia, the passage of a workmen's-compensation law in Virginia, anti-sabotage statutes in five western states, and the laws of nine commonwealths making work compulsory during the war for able-bodied males.

Minimum Wage. — The Minimum Wage Act for the District of Columbia (Public No. 215, 65th Cong.) applies to women and to children under 18. An unsalaried board of three members is authorized to investigate whether wages in any occupation are "inadequate to supply the necessary cost of living" to employees "to maintain them in good health and to protect their morals." If it finds wages to be below this standard, the Board may in the case of women workers call a conference of three representatives of employers, three of employees, and three of the public, to determine minimum time or piece rates; in the case of children the Board may fix rates itself. The usual provisions for public hearings before rulings become effective and for special rates for apprentices and less efficient workers are included. Violations are to be reported to the corporation counsel of the District. In Louisiana a joint legislative commission was appointed to investigate minimum wages and minimum hours for women and children and to report in 1920 (No. 126).

Minimum-wage rates for various public employees were established or increased by Maryland for road laborers (Ch. 50); by Massachusetts for laborers in Worcester (Sp. Ch. 84); by New York for lower-paid civilian employees of the state (Ch. 556); and by the United States for postal clerks (Public No. 185, 65th Cong.), printers and Botanical Garden laborers (Public No. 191, 65th Cong.), Treasury Department mechanics (Public No. 181, 65th Cong.), and general civilian employees of the Government and of the District of Columbia (Public No. 188, 65th Cong.). Congress also (Public No. 181, 65th Cong.) appropriated $5,500,000 to enable the Secretary of Labor during the war to furnish information and to render assistance in the employment of wage earners and to aid in the standardization of all wages paid by the Government or its agencies, but no money "appropriated for the payment of wages not fixed by statute shall be available to pay wages in excess of the standard determined upon by the War Labor Policies Board" (see also *Labor, supra*).

Health Insurance and General Social Insurance.—Louisiana authorized a legislative committee to investigate the establishment of state workmen's-compensation and other insurance of a like character (No. 37). New York created a commission to investigate retirement pensions for the civil service (Ch. 414). Pension laws were passed by Massachusetts for scrubwomen in Suffolk County (Ch. 172); by New Jersey for county employees reaching the age of 79 after 25 years' service (Ch. 164); and by New York authorizing half-pay provision for employees of Jamestown at the age of 60 (Ch. 523). Massachusetts also appropriated $5,000 to encourage the promotion of mutual sickness, disability and old-age insurance in industrial plants. (Res. Ch. 70.)

Workmen's Compensation. — Virginia is the latest recruit in the workmen's compensation camp, making 41 states and territories which now have this form of social insurance, in addition to the Federal Government's model act for its more than 1,000,000 civilian employees and its Soldiers' and Sailors' Insurance Act.

Thirteen of these laws are compulsory. Four base compensation on 55 per cent. of wages, four on 60 per cent., three on 65 per cent., and five on 66⅔ per cent. Sixteen provide for insurance in a state-managed fund.

The Virginia Act (Ch. 400) is elective, and applies to public employment and to all employers having 11 or more employees, except domestic and farm help and railroad employees. Medical care must be furnished for 30 days. For total disability, compensation is 50 per cent. of wages, but not more than $10 or less than $5 weekly for 500 weeks, and not more than $4,000 in all. The waiting period is 14 days. Failure to use a safety device or perform a duty required by statute, or wilful breach of a shop rule, debars from compensation. If an employee is injured who has previously sustained a permanent injury in the Army, Navy, or other employment, he shall be compensated for only so much of the incapacity as results from the subsequent injury considered by itself. An Industrial Commission of three members is to administer the act, and either stock, mutual, state-fund, or self-insurance is permitted; there is no provision, however, for establishing a state fund. (See also XIII, *Property and Casualty Insurance.*)

Kentucky extended her compensation act to all employers of three (instead of five) or more, and reduced the waiting period from two weeks to seven days (Ch. 176). Louisiana increased the scale of compensation from 50 to 55 per cent. (No. 38), and made it a misdemeanor to deduct premiums for liability or compensation insurance from wages (No. 39). Massachusetts raised the minimum weekly compensation for total disability from $4 to $5 (Ch. 113), extended the law to cover certain bridge employees (Ch. 125), and excused unintentional inaccuracies in the filing of claims (Ch. 119). New Jersey created a workmen's-compensation bureau in the Department of Labor (Ch. 149), and arranged to meet the expense through an assessment of $400 on the employer of each workman except a domestic or farm laborer who dies under circumstances that would have entitled dependents to compensation but who leaves no dependents (Ch. 203); to defray expenses incurred by the commissioner of banking and insurance in carrying out the compulsory-insurance provisions of the compensation act, mutual and stock insurance companies are taxed annually one-quarter of one per cent. of the net premiums received for this type of insurance (Ch. 72). In New York the compensation law was extended to theatrical hands and to all other employments in which four or more manual workers are regularly engaged (Ch. 634); to longshore work and the operation and repair of vessels (Ch. 249); and to foresters and surveyors in state service (Ch. 633); lumbering operations for fire wood, employing not more than four persons, were exempted (Ch. 635). Porto Rico made workmen's-compensation insurance compulsory in a state fund, provided for hospital care, and otherwise amended the law; the administrative commission was reorganized, and may now increase insurance rates in accordance with the degree of extraordinary hazard because of careless management or lack of safety appliances (No. 10). Congress extensively amended the War Risk Insurance Act of Oct. 6, 1917 (*A. Y. B.*, 1917, p. 353); compulsory allotments were made uniform at $15, family allotments at $5, and women in the service were put on the same basis as men (Public No. 175, 65th Cong.); employment of attorneys or claim agents was discouraged (Public No. 151, 65th Cong.); and benefits were extended to crews of vessels under friendly foreign flags (Public No. 195, 65th Cong.).

Vocational Rehabilitation.—Following the lead of the Federal law (Public No. 178, 65th Cong.), providing for the rehabilitation and reëducation of crippled soldiers and sailors and their restoration to self-sustaining industrial pursuits (see XIV, *Vocational Education*), Massachusetts established under the Industrial Accident Board a division for training and instructing those disabled by industrial accidents; the Board may coöperate with the United States Government and with the state Board of Education (Ch. 231).

Hours of Labor.—Kentucky required eight hours' actual labor from county road employees (Ch. 23), and the United States set an eight-hour day for certain post-office laborers and clerks (Public 185, 65th Cong.). Massachusetts extended the women's hour laws to women and children elevator operators (Ch. 147), but excluded certain public farm workers from customary hour restrictions (Ch. 90). Virginia extended the women's ten-hour law to laundries, offices, and canneries and stores in country districts (Ch. 214, 414). Louisiana (No. 126) authorized an investigation of hours of work for women and children (see also "Child Labor," *infra*).

With regard to rest periods, Massachusetts authorized Quincy and Waltham to provide Saturday half-holidays for city employees (Sp. Ch. 32, 80); Mississippi gave Saturday half-holidays to women employees of the state during the summer (Ch. 494). The United States required compensatory time off for certain railway postal clerks if they were required to work on Sundays or holidays (Public 185, 65th Cong.), and also regulated the hours and rest periods of deck officers both in port and at sea (Public No. 147, 65th Cong). Porto Rico broadened its one-day-of-rest-in-seven law to apply to employees of enterprises exempted from the Sunday-closing law (No. 3).

Employment. — Compulsory-work laws similar to those enacted in 1917 by Maryland and Virginia (*A. Y. B.*, 1917, p. 430) were passed in 1918 by nine states—Delaware, Georgia, Kentucky (Ch. 178), Louisiana (No. 139), Massachusetts (Ch. 286), New Jersey (Ch. 55), New York (Ch. 625), Rhode Island (Ch. 1661), and South Dakota (Ch. 62). These statutes most often apply to unemployed able-bodied males between 18 and 50, and require 36 or more hours' labor a week upon proclamation by the governor or the State Council of Defense that such labor is essential to the welfare and protection of the state. Persons temporarily unemployed because of differences with their employers, students, and persons preparing themselves for industry are exempted in nearly all of the laws. Maryland created a legislative committee to confer with the War and Navy Departments for securing agricultural labor (Res. No. 9, 12), and Montana asked Congress to enact laws for registration and assignment of labor.

Regulation of private employment agencies was lodged with the Department of Labor in Louisiana (No. 145) and New Jersey (Ch. 227), and the latter state created in the Labor Department a migrant welfare and employment bureau (Ch. 235). New York authorized an additional public employment office in the locality where it would best serve the interests of the negro population (Ch. 356). The Federal act for vocational rehabilitation of disabled soldiers and sailors (see XIV, *Vocational Education*) appropriated $45,000 for the placement, and supervision after placement, of vocationally rehabilitated persons; an additional $55,000 was appropriated for studies of this subject (Public No. 178, 65th Cong.). The further sum of $250,000 was appropriated to be used as a revolving fund to enable the Secretary of Labor to advance transportation to war workers (Public No. 109, 181, 65th Cong.). South Carolina passed four statutes requiring county road work or providing for commutation of such duties by a money payment (No. 417, 495, 502, 503).

Child Labor. — Further advances were made in raising the legal minimum age for employment of children. The age was raised from 12 to 14 in Maryland for vacation work and canneries (Ch. 495); from 14 to 16 in Virginia for mines and quarries and from 14 to 18 for girl messengers (Ch. 204); and from 16 to 17 in Wisconsin for street trades except where compulsory schooling ends at the age of 16 (Ch. 12). Wisconsin also excused minors with working papers from attending evening school, but made four hours' weekly attendance at evening or vocational school a condition of employment for "illiterate" minors over 17 (Ch. 2). New York permitted children between 14 and 16 to work in stores and offices during the summer upon securing permits (Ch. 628). Modifications in the issuance of employment certificates were made in Kentucky (Ch.

102), Maryland (Ch. 495), New Jersey (Ch. 204), and Virginia (Ch. 204). A New York law prohibits women entirely from night messenger service and from day messenger service under the age of 21; the six-day and 54-hour week was extended to women day messengers, as well as the existing laws for washing and toilet facilities (Ch. 434). New York also reduced the minimum age for masters', pilots' or engineers' licenses on small steamers from 21 to 18 (Ch. 190). (See also "Hours of Labor," *supra.*)

Safety and Health.—Rhode Island (Ch. 1616) and Virginia (Ch. 313) prohibited common drinking cups, and the former also forbade common towels (Ch. 1616) and the use of the suction or "kiss of death" shuttle in textile mills (Ch. 1632). Porto Rico postponed until 1920 the date of effect of the act of 1917 regulating weights that may be carried (No. 6).

Amendments were made in the structural requirements for factories in New York State (Ch. 627) and in the city of Cranston, R. I. (Ch. 1689), and Virginia required hoods and exhaust devices on grinding or buffing wheels (Ch. 206). New York called for vestibuled cabs on locomotives (Ch. 649), and the United States required certificated life-boat men on vessels under the Seamen's Act (Public No. 147, 65th Cong.). Massachusetts empowered the Board of Labor and Industries to require facilities for heating lunches in establishments employing 100 or more (Ch. 110). New Jersey provided for zoning of factories in cities (Ch. 146). Louisiana required seats for female elevator operators (No. 158), and Texas enacted sanitary regulations for women in certain industries and stores (H. B. 94).

Administration of Labor Laws.—Efficiency in the administration of labor laws is a matter of increasing concern. Massachusetts authorized five additional inspectors under the Board of Labor and Industries (Ch. 276), and the supervisor of administration is to investigate the organization, methods and efficiency of the Board (Res. Ch. 73); the supervisor of administration is to investigate also working conditions of employees of the commonwealth and to report a plan for classifying positions and standardizing salaries (Res. Ch. 86). New York provided remuneration at $10 a day of actual service and traveling expenses for the members of the industrial council which is advisory to the Industrial Commission (Ch. 355); the Commission was given discretionary power over the organization of divisions in the bureau of statistics and information (Ch. 456). Louisiana increased the salary of the commissioner of labor and industrial statistics from $2,000 to $2,400 (No. 232). New York raised the salary of the deputy in charge of the bureau of mediation and arbitration from $5,000 to $6,000, and that of the Industrial Commission's counsel from $6,000 to $7,000 (Ch. 595). Rhode Island raised the salary of assistant factory inspectors from $1,500 to $1,800 (Ch. 1676). Massachusetts increased the salaries of the Board of Conciliation and Arbitration from $2,500 to $3,000 (Ch. 225); the United States raised the pay of the chief inspector under the railroad safety-appliance law to $5,000, of the assistant inspectors to $4,000, and of the district inspectors to $3,000 (Public No. 176, 65th Cong.). In Kentucky the mine safety work was reorganized and a Department of Mines was created (Ch. 25). Boiler inspection was reorganized and a new boiler-inspection bureau established in New Jersey, and salaries of employees of the bureau were increased from $1,500 to $2,000 (Ch. 213). Boiler-inspection rules in Massachusetts must now be approved by the council as well as by the governor (Ch. 257). The New Jersey Civil Service Commission was instructed to classify all state employments and to standardize services, compensation, lines of promotion, hours, and employment conditions (Ch. 24). The Industrial Commission in New York must now furnish blanks to physicians outside of first- and second-class cities examining children to determine fitness for employment (Ch. 459).

Trade Disputes.—Sabotage was defined in Arizona as wilful and malicious injury of property, or violation of the constitutional or statutory rights of another as a means of accomplishing industrial or political ends, and its advocacy was made a felony (Ch. 13). Similar statutes were enacted in Montana (Ch. 7), Nebraska (Ch. 9), North Dakota (Ch. 12), and South Dakota (Ch. 38), and in addition Montana urged Congressional action on the subject (H. J. M. 1). In Massachusetts the Board of Conciliation and Arbitration must notify workmen and employers of hearings (Ch. 251). The Foundation for the Promotion of Industrial Peace was directed by Congress to return to Theodore Roosevelt, the original donor, certain funds it could not use (Public Res. No. 37, 65th Cong.).

Wage Payment and Liens.—Massachusetts required weekly payment of club employees in cities (Ch. 87). Virginia brought railroad, steamship, and mining companies under the semi-monthly pay law, forbade overcharging at company stores, and permitted payment in scrip provided the unused portion is redeemable in lawful money or check (Ch. 389). Statutes protecting wages by lien, bond, or otherwise were strengthened in Kentucky (Ch. 36, 75), Louisiana (Ch. 224), Maryland (Ch. 127), Massachusetts (Ch. 265), Mississippi (Ch. 128, 217), and New Jersey (Ch. 75,280). Massachusetts passed two important measures forbidding deductions from wages for tardiness in excess of the amount that would have been earned (Ch. 192) and forbidding employers to take any gratuity given to their employees for checking clothing (Ch. 149). New Jersey provided for the recovery of wages lost by municipal employees through illegal discharge (Ch. 139), and the Virginia law making it larceny to enter into a contract of employment with intent to defraud was expanded to include oral contracts (Ch. 179). The customary prohibition of time studies on government work was inserted in the Federal Army and Navy Appropriation Acts (Public No. 189, 193, 65th Cong.).

Convict Labor.—Maryland requested its United States Senators and Representatives to expedite the passage of a bill seeking the employment of prison labor for the production of war supplies (Res. No. 13), and Louisiana repealed its law against employing convicts outside prisons or penal farms for private purposes (No. 210). New Jersey provided for the sale of products of institutional labor on such conditions that they would not unfairly compete with the product of free labor, and prohibited convict labor on public improvements in conjunction with free labor or to take the place of free labor locked out or on strike (Ch. 147).

Miscellaneous.—The United States appropriated $1,335,000 for the Secretary of Labor to carry on war-labor administration, "including mediation and conciliation in labor disputes, the working conditions of wage-earners in the most essential war industries, the acquiring and diffusing of information on subjects connected with labor, the employment of women in industry, and the training and dilution of labor," and other contingent expenses (Public No. 181, 65th Cong.). Existing state police regulations relating to telegraph, telephone, cable or radio systems taken over by the Government were continued in force except where they may affect the transmission of government messages (Public Res. 38, 65th Cong.). New York prohibited the wearing of industry badges without permission (Ch. 265). Massachusetts arranged for the transfer of certain skilled employees of the Boston Transit Commission to the employ of cities and towns in the metropolitan district (Ch. 24), and Maryland established an examining board for skilled and unskilled road employees (Ch. 224).

XVI. AGRICULTURE, HORTICULTURE, FORESTRY AND FISHERIES

AGRICULTURE

E. W. ALLEN

Stimulating Food Production. — Never was such a widespread, concerted effort made in the direction of stimulating and aiding farmers to the largest practicable production of foodstuffs as during the year 1918. The United States, used to abundance and large surplus, had in a short year become thoroughly aroused to the necessity of special effort not only to satisfy its own immediate needs, but to meet its obligations in feeding the allied nations of Europe. The appeal was made and accepted as a patriotic duty, and the thoroughness of the campaign carried the call to the remotest parts of the country.

In accordance with a carefully considered programme, made in the fall of 1917 (*A. Y. B.*, 1917, p. 439), a wheat acreage of 42,000,000 acres was seeded, larger by a million acres than in any prior year and 7,000,000 acres greater than the preceding five-year average. This acreage was below the standard set in the programme, but the fall of 1917 was unfavorable, the weather being exceedingly dry in important sections, the harvest late, farm help short, and other conditions adverse. In view of these conditions the acreage seeded was considered a very satisfactory response.

Early in the year President Wilson in a message to the farmers called upon them for a supreme effort to meet the needs of the country, the armies, and the Allies. In February the Department of Agriculture issued an agricultural programme for 1918, with special reference to spring planting and to live stock. This amplified the programme issued in August, 1917, and emphasized the importance of planting an increased acreage of spring wheat and the production of an increased supply of other crops and of live stock, especially hogs.

The organization for carrying out this programme and for extending every possible aid toward its accomplishment was extensive and thorough. All the efforts of the Department of Agriculture, the agricultural colleges, the State Councils of Defense and other agencies were joined to that end. Lectures were arranged for by the Department and the Food Administration in the spring, prominent agricultural speakers being sent through the various sections of the country to impress upon the farmers the necessity of producing large crops. In nearly all of the states committees on agricultural production and food conservation and supply were increasingly active during the year, being more thoroughly and extensively organized than in 1917. These usually operated in coöperation with or as branches of the State Councils of Defense. The efforts were quite largely centered in the agricultural colleges, and where the colleges were not centers of the work, their experts took a very active part in the various operations. These colleges, especially their extension departments, were the chief agencies through which the Federal Department of Agriculture operated in carrying on its campaigns, and the experts in the experiment stations joined hands in supplying needed information and expert service. The efficiency of the system which had been established through these colleges and the close coöperation which existed between them and other state and Federal agencies were great elements of strength in covering the country and maintaining a personal touch with the whole body of producers.

In the early spring the Department of Agriculture gave special attention to providing farmers with suitable supplies of good seed, especially of kinds that were scarce and in localities where safe seed was lacking owing to failure of crops to mature properly. The deficiency in seed corn was especially marked; it was unprecedented in degree and extent, ranging from 25 to 75 per cent. in the principal corn-producing states, and affecting all the north-central states, where practically two-thirds of the corn crop is produced.

The Department of Agriculture had at its disposal $2,500,000 to be used as a revolving fund in assisting to supply farmers with sound seed, and in the emergency estimates submitted to Congress an additional $6,000,000 was asked for. Supplies of sound seed were sought out and purchased, large seed dealers were placed under license by the Food Administration with a view to preventing extortion, and several state seed-growers' associations volunteered to sell their seed at reasonable prices. In this way an emergency that at one time threatened seriously to interfere with the programme for enlarged production was successfully met.

In addition to the close contact maintained with producers, various surveys were made in the states to determine actual conditions, resources and needs, these surveys in some instances being made with great thoroughness and providing such a fund of detailed information as had never before been gathered. In several of the eastern states, for example, where there was a considerable revival of cereal culture and machinery was short, binders and threshing outfits were located and put into operation on schedules which insured farmers the needed help. In other cases, attempts were made to standardize the varieties grown in order that they might be handled to better advantage, and products were directed to nearby markets to avoid long hauls and effect more direct dealing.

The whole country was aroused to the patriotic use of land, whether in small garden tracts or in large farm areas, to do away with "slacker" land. While considerable areas of land remained unoccupied, taken in the aggregate the use of land was more complete and intensive than ever before in the history of this country. In 1917 the extent of acreage in crops was estimated by the Department of Agriculture at 345,647,000 acres, or 16 per cent. above that for the census year 1909. In 1918 the land employed showed a further large increase.

The Crop Year.[1]—While the billion-bushel crop of wheat aimed at was not fully attained, the production was the largest on record with the exception of that of 1915; it was some 280,000,000 bus. over the 1917 crop and 108,000,000 bus. above the five-year average. The winter-wheat acreage was the second largest ever harvested, representing an increase of nearly one-third over 1917, while the spring-wheat area was the largest ever grown by 2,000,000 acres. The total wheat acreage (winter and spring) represented an increase of about 28 per cent. over 1917. This shows the response of the farmers to the special appeals made to them. This response extended throughout the country, wheat growing being revived or largely increased in many sections outside the regular wheat areas. The winter injury to fall-sown wheat was severe over large areas, reducing the return from the unusual acreage sown and causing much to be abandoned; but the production of winter wheat was considerably above that of 1917 and slightly larger than the five-year average. Spring wheat showed a large increase, so that the total wheat production as estimated on Dec. 11 was 917,100,000 bus.

The corn area was reduced from that of 1917, as was expected, but the crop was an average one. It suffered a considerable loss in some sections as a result of hot, dry weather in July and August, which, however, caused the corn to mature earlier and made it safe from early frosts except in extreme northern areas. Although the total crop was more than 480,000,000 bus. less than in 1917, the quality was better, much of the 1917 crop having been extremely poor.

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[1] For the final December estimate of the production of the principal crops, see the tables at the end of this department.

The oat crop turned out well above earlier hopes, amounting to more than a billion and a half bushels and leading all cereals except corn. It was well above the five-year average and has been only twice exceeded, being only 3.4 per cent. below the record crop of 1917. The quality was high. The barley crop was the largest ever raised in the United States, even exceeding the large crop of 1915, and the rye crop on an increased acreage was also a record for this country.

The area planted to potatoes was slightly less than in 1917, which was the largest on record, and there was a corresponding decrease in production, but the crop was well above the five-year average. The sweet-potato crop also was a large one. Rice was a record crop, amounting to over 40,000,000 bus., 12,000,000 bus. above the five-year average. Buckwheat, although one of the minor crops, was also the highest for many years.

The harvest of food crops, therefore, was a bountiful one, in spite of frost and drought which cut down anticipated production in some lines, and the returns were such as to encourage belief that the increased supply to the European Allies of 5,730,000 tons of food grain called for by the Food Administration could be spared. The agreement entered into by the Food Administration with the food controllers of the Allied nations calls for the shipment of 409,320,000 bus. of grain, of which from 100,000,000 to 165,000,000 bus. may be other than wheat.

The outlook for tobacco was for the largest crop ever grown in this country. Cotton at less than 12,000,000 bales, although nearly 400,000 bales above 1917, was short of the five-year average by a million and a half bales. There was a heavy decrease in the acreage in the older Sea Island sections, especially in Georgia and Florida, where the boll weevil is active, and a corresponding increase in the area planted to Egyptian cotton in Arizona and California. The production of American-Egyptian cotton has gone steadily ahead. Hay crops show a material falling off compared with 1917 and the five-year average.

Interest attaches to the sugar-producing crops on account of the world-wide shortage, although the contribution from continental United States is a relatively small item. The world shortage has amounted to over 2,000,000 tons annually since the war began. The area planted to sugar beets in the United States in 1918 was 689,700 acres, 117,000 less than in 1917 and 79,000 less than in 1916. However, in the last two years an abnormal amount of the planted area was abandoned, and the October estimate was for a somewhat larger crop of beets in 1918 than in 1917 or the five-year average. Sixteen new beet-sugar factories were built in the United States in 1917 and equipped for handling the 1917-18 crop, making 100 such factories in this country. The area of the sugar-cane crop is estimated at 533,880 acres, or 12 per cent. above the acreage reported by the census in 1909. This estimate is for ribbon cane only and does not include sorghum cane.

The castor bean sprang into prominence as a crop in the South, to meet the need for oil for airplanes. Castor oil is found superior to mineral oils for use in the rotary type of motor. The War Department estimated the acreage of beans necessary to supply the oil needed, and early in the season contracts were let for the growing of these beans. It is estimated that 2,000,000 gals. of castor oil will be available from the 1918 crop planted on 108,000 acres in eight southern states and California, and from a large acreage in Cuba, Haiti and Santo Domingo.

Farm Labor.—The labor problem on farms was increasingly acute during the year, owing to the number of laborers entering military service or leaving the farm for larger wages in industrial establishments. The outlook made farmers hesitate to put in maximum crops, and although they were encouraged by promises of assistance, there was much apprehension least they would not be able to handle the crops. To meet this crisis the Department of Agriculture greatly extended and strengthened its organization. Prof. G. I. Christie, director of agricultural extension in Indiana, was appointed assistant to the Secretary of Agriculture in April and assigned to direct the activities in this line. The country was divided into four farm-labor divisions, each in charge of a supervisor, and a farm-help specialist was placed in practically every agricultural state. The latter worked in close coöperation with the agricultural colleges, the extension county agents, the state and Federal labor offices, Councils of Defense, chambers of commerce, and similar organizations. In most towns campaigns were conducted for volunteer workers, and the "work or fight" sentiment was vigorously propagated everywhere. Labor surveys were made to determine the needs, in which the county agent took an important part, and with the combined help of the various agencies a large amount of labor was mobilized.

Many colleges gave special short courses for prospective farm workers, enrolled students for vacation work on farms, and closed early in the summer to further this plan. This was especially the case with the colleges of agriculture. The Boys' Working Reserve was greatly enlarged, training given in connection with the schools in simple operations, the handling of horses, etc., and several hundred thousand boys placed on farms for the summer. The results in the majority of cases were reported as very satisfactory. Farmers in many sections of New York, for example, were largely dependent upon such help. When it is realized how large a part farm children have always played in the production of food and in farm operations, the assistance which these boys could be with a little preliminary training is readily understood. Women were registered for farm work in considerable numbers, and training provided to fit them for it. In certain localities they were employed for lighter forms of work. (See also XIV, *Unemployment.*)

The calling of drafted men into the service was delayed as far as was found consistent with the military programme. The new draft regulations definitely recognized the necessity of guarding the farm-labor supply, and stipulated that claims for deferred classification be filed for such workers as were actually needed. To keep the district boards advised of the local and regional requirements and supply of farm labor and to assist them in protecting this industry, provision was made for an agricultural advisor to each district. A plan was put into effect for utilizing conscientious objectors at Army cantonments in farm work. These men were furloughed under strict regulations and placed on farms through the aid of the farm-help specialists. They were allowed a standard wage, and reports of their conduct and efficiency were made to the cantonment commander monthly.

As the harvest approached it was apparent that the farmers had raised bigger crops than they could handle. A volunteer harvest army, estimated at no less than a million men, was recruited from the towns and cities to help gather these crops. These volunteers were business men, college students, factory workers, bank and store clerks, firemen, etc., who devoted their vacations to this service or were released by their employers for short periods. Forty-thousand such workers were recruited in Illinois, 30,000 in Kansas, 10,000 in Indiana, 15,000 in South Dakota, 20,000 in Minnesota, and so on. In some localities "twilight labor squads" were formed, which were taken to the fields in automobiles after their regular work to help in shocking and handling cut grain. Town women volunteered to help the farm women in the preparation of meals for the harvest workers.

By this means the world's bread crops were saved for another year in the face of unprecedented labor scarcity. In Illinois, for example, where approximately 25,000 experienced farm hands had been inducted into military service under the draft and many thousand more had volunteered or gone into competing industries, the labor needs were met to such an extent that the state produced its greatest food crop. Taking the country over the result was a remarkable achievement.

Farm Wages.—Definite information concerning the large increase in wages of farm labor in 1917 (*A. Y. B.*, 1917, p. 443) was brought together in a publication by the Department of Agriculture. Wage rates per month with board ranged from $21.88 in the south-central states to $36.23 in the north-central states west of the Mississippi, and $44.25 in the western and Pacific states, with a national average of $28.87. As a general average for the whole country, the increase over 1916 was 24.2 per cent. and the increase over 1910 was 50.3 per cent. There were corresponding increases in the wages of day labor and harvest labor. The analysis shows that the rates of wages for farm labor increased almost one-fourth in one year and about one-half in seven years.

Value of Farm Products in 1917.—The Department of Agriculture has calculated the total gross value of the wealth produced on farms in 1917 at $19,440,000,000. Of this amount $13,611,000,000 was in crops and $5,833,000,000 in animal products. This is an enormous increase over any preceding period, due largely of course to unusually high prices. While the aggregate production in 1917 was only 12 per cent. above 1916, the price index numbers of the principal crops was 35 per cent. above the latter year and 111 per cent. above 1915.

Wheat Programme for 1919.—A national plan for a great liberty wheat harvest in 1919 was announced by the Department of Agriculture in July. In a message to the American farmers the Secretary of Agriculture stated that the carry-over from the 1917 crop was practically exhausted and was the smallest on record. The export of wheat (in excess of imports) in the fiscal year 1918 was approximately 100,000,000 bus., as compared with 178,000,000 bus. in 1917, 236,000,000 bus. in 1916, and 331,000,000 bus. in 1915. Farmers were asked to sow not less than 45,000,000 acres of winter wheat, an increase of seven per cent. over the acreage of 1917. This stipulated acreage, it is estimated, would produce 636,000,000 bushels. The programme assigned definite acreages by states, as in 1917, and campaigns were conducted through the farm bureaus and by other means to induce growers to make good their state quotas.

Price Fixing and Regulation.—A movement to increase the guaranteed minimum price for wheat, fixed by the President in 1917 at $2.20 for No. 1 northern spring wheat and its equivalent (*A. Y. B.*, 1917, p. 439), was started early in the year and crystallized in an amendment to the Agricultural Appropriation bill raising the price to $2.50 for No. 2 northern spring wheat of the 1918 crop. This amendment caused much controversy in Congress but finally prevailed. The change was advised against by the Agricultural Advisory Committee of the Department of Agriculture, and the measure was killed by the President's vetoing the entire Agricultural bill. The same price as in 1917 was announced, and in September this price was continued for the crop of 1919. At that time the President announced that in guaranteeing a price for wheat in advance (the only branch of industry thus guaranteed) a considerable national risk was involved, which might result in a loss to the nation of as much as a half-billion dollars through an unsalable surplus. To meet the pressure for an increased price, the appointment of a committee in the spring of 1919 was promised, to consider the increased cost of wheat production with a view to changing the price schedule if found justifiable.

The Department of Agriculture revised the standards for wheat and shelled corn, effective July 15, 1918. The new wheat grades will result in a greater proportion of the crop falling into the higher grades. The Food Administration ordered a decided reduction in prices of milled feeds (bran, middlings, etc.), the new schedule being based on the prices of wheat and going into effect on May 7.

There was considerable discussion of fixing prices for cotton, and this was suggested in a statement issued by the President by reason of the early agreement with the Allies under which the United States acts as a common buyer. The cotton commission, however, decided at the end of September not to recommend price fixing at present, but to attempt to stabilize the distribution of different grades. The use of food products for the production of malt liquors for beverage purposes, including near-beer, was prohibited after Dec. 1, 1918.

The licensing of the fertilizer industry was ordered in a Presidential proclamation in February, the measure being placed in charge of the Department of Agriculture to prescribe regulations. The Department purchased with a special appropriation approximately 100,000 tons of nitrate of soda, which it distributed to farmers at cost. In May the farm-implement industry was placed under the license system, the Secretary of Agriculture being authorized to carry out the provisions of the President's proclamation and prescribe regulation. The aim was to prohibit unjust profits, price increases and attempts to monopolize, and otherwise to protect consumers. There was no provision for direct price fixing, which may be largely controlled through the license. The War Industries Board curtailed the manufacture of implements and equipment by discontinuing approximately 3,000 surplus types of plows and tillage implements and by effecting further standardization.

On June 1 the Bureau of Markets of the Department of Agriculture took over all the Chicago Union Stock Yards, telegraph reports on live-stock, receipts and prices, and became the agency for their distribution. Subsequently, all stock-yard companies, commission men and individual traders were placed under license (see also *Live Stock*, *infra*). The wool supplies of the United States were taken over by the War Industries Board in the spring and a wool administrator was appointed to supervise distribution (see *ibid.*). Arrangements were made over the country for farmers to sell their wool to accredited buyers in order to secure its coming under Government control. Prices were fixed, and speculation or any form of buying, directly or indirectly, was prohibited. In September the Sugar Equalization Board fixed the price of sugar for the coming year at nine cents for the granulated product. (See also XII, *The Conduct of Business.*)

U. S. Department of Agriculture.—The Agricultural Appropriation bill for the support of the Federal Department of Agriculture in 1918-19 did not pass Congress until near the end of September, and the Department was kept in operation by resolutions continuing in force the appropriations as made for the preceding year. The Act carried a total appropriation of $27,875,353, an increase of nearly two millions over the preceding year.

Among the new items authorized were: $500,000 for the investigation, control and eradication of tuberculosis in animals; $150,000 for destroying vegetation from which originate rust spores causing this disease in cereals; $25,000 for studies of the manufacture and use of insecticides and fungicides; $113,000 to enable certification in disputed cases as to the quality and condition of fruit, vegetables and other perishables received at large market centers; $50,000 for installing an experimental milling and baking plant for studying the qualities of cereals; $250,000 for studies of drying or dehydrating vegetables, fruits, etc., and the food value of such products; $25,000 for investigating the corn root and stalk diseases; and $20,000 for the control of the sweet-potato weevil.

The appropriation for cattle-tick eradication in the South was increased from $631,560 to $750,000, and that for hog-cholera investigation and control from $413,100 to $446,900, and the fund for combating and exterminating the pink boll worm of cotton was raised to half a million. The appropriation for animal husbandry was increased by $31,000, especially for experiments in breeding and maintenance of Army horses and for poultry feeding and breeding, that for controlling insects on truck crops by $20,000, that for bee culture by $15,000; and there were substantial increases for breeding and other work with staple crops.

Several of these appropriations were made in part to enlarge the extension work in the respective lines. Additional funds over 1917 were given for administration, for the enforcement of laws with which the Department is charged, and for general maintenance.

Estimates for an emergency food-production fund were submitted to Congress early in the year, and a bill was framed carrying a total appropriation of approximately $17,000,000. The largest items were for the purchase of seed to be sold to farmers at cost, for enlargement of the agricultural extension work and the market-news service, for the prevention and control of insects, plant diseases and the ravages of animal diseases, and for dealing with the farm-labor problem. The bill was made the vehicle for special legislation, much of which had no relation to agriculture, and it had not passed at the close of the crop season. The Emergency Act passed in 1917, however, was continued from month to month, enabling the work formerly authorized to be maintained temporarily.

An Agricultural Advisory Committee of 24 persons, representing agricultural and live-stock interests in various sections of the United States, was appointed by the Secretary of Agriculture and the Food Administrator and organized in Washington in March. This Committee presented recommendations from time to time during the year.

The Department, like many other institutions, experienced much difficulty in maintaining its staff of workers. More than 6,000 regular employees left its service between the declaration of war in 1917 and the close of the fiscal year 1918 to take up war service or engage in other occupations. Adequately trained and experienced men to fill their places were difficult to find. Assistant Secretary R. A. Pierson resigned in the fall to resume his duties as president of the Iowa State College, and Prof. G. I. Christie of Indiana was appointed to succeed him. In September a committee of men familiar with food production and agricultural organization, headed by President W. O. Thompson of the Ohio State University, was sent abroad to study conditions and needs in England, France and Italy with a view to the effective correlation of effort in those countries and in the United States. A party of experts from the Bureau of Plant Industry was sent to Algeria, Tunis and Morocco, at the request of the French High Commission, to advise upon the possibilities of increasing the agricultural output of these French colonies.

Experiment Stations.—The ranks of the experiment-station forces were seriously depleted by men leaving to join the forces or to accept assignment to special war duties. Few new projects or lines of study were inaugurated, but the work shifted in many instances to features promising results having special economic or practical bearing at the present time. The specialists worked in very close touch with the farm bureaus. State Councils of Defense and similar agencies, frequently serving as leaders in agricultural and food enterprises and otherwise turning their expert knowledge to practical account.

The stations continued to be well sustained financially and there were improvements in the facilities for their work, showing no decrease in the appreciation and the estimation of necessity in which they are held. In Iowa a new dairy barn with special provision for experimental work was erected at a cost of $18,000. In Minnesota the beef-cattle barn which was burned in 1917 was replaced at an expense of over $20,000, and two hollow-tile silos were built, together with a new hollow-tile seed house for the agronomy department. In Montana a new chemical laboratory was in process of erection to replace the building burned in 1917; it will be fireproof, and will cost something over $100,000 without furniture and fittings. At the Oregon Station a substantial fruit-products building was erected and equipped, this being one of the first and most complete buildings of its kind at any experiment station. A new live-stock building for the Utah College and Station was completed, but it is being used temporarily as a barracks for soldiers taking technical training. In Wisconsin a new soils building was completed, of fireproof construction and thoroughly modern in all its provisions for this special line of work.

The Federal appropriations for the stations in Alaska, Hawaii, Porto Rico and Guam were each increased $5.000, and provision was made for taking over the experiment station in the Virgin Islands in operation since 1910, an appropriation of $15,000 being made for maintenance. In Virginia the state appropriation for the station was increased to $30,000 a year, adding about $14,000 annually; and in Kentucky the state appropriation of $50,000 a year was freed for station work by the provision of funds for other activities formerly supported by it. Irregularities in the conduct of the Georgia Station led to the suspension of the Federal funds for more than a year; the State granted no aid, and although an attempt was made to continue with funds from the sale of products, the station staff was considerably depleted and some of the work greatly interrupted. The veterinary department of the Nebraska Station was strengthened by placing at its head Dr. L. Van Es, formerly of the North Dakota Station, with provision for adequate support and for a new veterinary building of thoroughly modern type.

A new branch station for high altitudes was located at Felt, in Teton County, Idaho, at an elevation of 6,300 ft. The Missouri Station took steps to establish three new soil-experiment fields on typical soil areas. A sheep experimental farm was established in the mountain section in western North Carolina, materially enlarging the facilities in that line. The Washington Station leased a quarter-section of land at Waterville for a period of 20 years for carrying on forage and cereal investigations. Arrangements were made for a branch station at Lander, Wyo.

The administration of the food and drug inspection in Kentucky, formerly in charge of the station, was transferred to the State Board of Health, but provision was made for having the technical examinations made at the station as formerly. The regulatory duties of the station were extended by the passage of a new law requiring the licensing of creameries and shipping stations, examination of milk testers, glassware, etc. In Wisconsin the inspection and regulatory work, except the advanced registry and cow testing, was transferred to the direction of the State Department of Agriculture.

There were several important changes in directorship during the year. Dr. R. H. Forbes of the Arizona Station was given a year's leave of absence to assist in agricultural war service in the Valley of the Nile. J. S. Jones resigned as director of the Idaho Station to engage in war work, and the office was combined with the deanship under E. J. Iddings. The resignation of Dr. H. J. Waters from the presidency of the Kansas Agricultural College was followed by the appointment as president of Dr. W. M. Jardine, former dean and director of the station, who was succeeded by F. D. Farrell of the Bureau of Plant Industry. Director Thomas Cooper of the North Dakota Station resigned at the beginning of the year to become dean and director of the agricultural college and station at the Kentucky State University. He was succeeded by Dr. P. F. Trowbridge, head of the department of agricultural chemistry in Missouri University and Station. Dr. H. G. Knight, director of the Wyoming Station, resigned to accept the deanship and directorship in the Oklahoma College and Station. He was succeeded by Prof. A. D. Faville, formerly animal husbandman. Dr. W. P. Brooks, director of the Massachusetts Station since 1906, resigned in September.

Prof. T. L. Haecker, for many years in charge of dairy work and animal nutrition in the Minnesota College and Station, retired. Dr. Raymond Pearl, biologist of the Maine Station, resigned to accept a position in the Johns Hopkins University. Dr. W. B. Mack, head of the department of veterinary science and bacteriology in Nevada University and Station, died on June 18, and Prof. James H. Sheppard, chemist of the North Dakota Station since 1888, died on Feb. 21.

Agricultural Extension.—Agricultural extension work has continued to grow by leaps and bounds and to increase in efficiency. It has been a highly important factor in promoting larger food production and conservation throughout the country. The funds available for 1918 from Federal and state sources amounted to approximately $10,000,000, compared with about $6,000,000 in 1917. At the close of the fiscal year, the force of workers numbered more than 6,200 persons, including 3,000 men county agents, 2,034 women agents in home demonstration work, and 1,181 persons (men and women) engaged in club work among boys and girls. This is nearly twice the force of extension workers in 1917. Of a total of 2,936 agricultural counties in the entire country, 2,435 were supplied with men agents in 1918, and 1,715 counties had women agents. Seven hundred and fifty farm bureaus have been organized with a membership of nearly 300,000 farmers.

More than 2,400,000 boys and girls were reached through club work, which in 1917 produced and conserved products valued at $10,000,000. Membership in the pig clubs alone included 100,000 boys and girls, or more than twice the number enrolled in 1917, when 45,000 members produced approximately 10,000,000 lb. of dressed pork. All of these boys and girls are raising pigs under the supervision of local leaders. The standard set for the home canning work in 1918 was a billion and a half quarts, and the indications were that it would be realized.

The extension workers were the Department's agents for carrying out its various campaigns during the year for production, for locating and distributing seeds, relieving the farm-labor situation, etc. Very close contact was maintained with the farming people, and the advice and assistance lent was a great factor in stimulating larger and more effective effort.

Exterminating Rodent Pests.—Systematic and energetic campaigns were carried on throughout the country for the extermination and control of injurious rodents on farms, which, it is estimated, cause an annual loss of food and feed crops amounting to nearly $300,000,000. These enemies include, besides rats and mice, gophers, brown squirrels, prairie dogs, chipmunks, rabbits and field mice as the most destructive. The campaigns were instigated by the Biological Survey of the Department of Agriculture, and were largely carried on with the aid of county extension agents. Enormous numbers of these pests were destroyed, and the losses due to them were reduced many thousand dollars, estimates of the savings in single counties of the West running to more than $50,000.

Farm Tractors.—There was unusual interest during the year in the development and practical possibilities of the farm tractor. This grew in part out of the labor shortage, the need for maximum production, and the realization that labor-saving machinery must be more largely relied upon as a war-time necessity. Tractor demonstrations were conducted all over the country, especially in the North and West, and tractors were advocated for the relatively small farms of the East as well as for the larger areas of the Middle West and the West. The devising of several medium-priced machines furthered the wider introduction of the tractor. Although the gas tractor is still in process of development, it has already proved valuable and practical under quite a variety of conditions of farming, soil and topography. It has not assumed, however, a fixed place in general farm practice, and to that extent it is still somewhat in the experimental stage.

The tractor is gaining in popularity in the corn belt, a large majority of owners regarding it as profitable. Ability to do heavy work quickly, the saving of man power, enabling a man to farm a larger acreage, ability to give deep plowing and a better seed bed, are cited as among the practical advantages. Inquiry into the cost of plowing and other field operations with the tractor in the corn belt indicated that it did not differ materially from that with horses except in the item of labor. The latter averaged lower with the tractor than with horses, assuming equal wages. The advantage lay, as in the case of most other farm machinery, in the greater area which could be covered with a unit of labor. On an average about 2½ gals. of gasoline was required to plow an acre, although under unusually favorable conditions it might be reduced to about a gallon. Reduction in cost of farm production per acre from the use of a tractor is hardly to be expected from the experience had, but with it one man may increase his crop acreage to a considerable extent and hence the amount of crops he can raise. The extent to which a tractor replaces horses depends upon the type of farming, but up to the present it has not displaced work animals to the extent commonly expected.

An investigation of tractor production in the United States conducted by the U. S. Department of Agriculture showed that 58,543 tractors were manufactured in the first six months of 1918, as compared with 62,742 in the year 1917 and 29.670 in 1916. In the same period 15,610 were sold to exporters, as compared with 14,854 in 1917. The sales to users in 1917 were 49,504, and in 1916, 27,819.

It was announced at the beginning of the year that 1,500 farm tractors were being shipped from the United States to France to lighten the burden of toil of the old men, women, and children. Tractors have been extensively imported into Great Britain and employed in the campaign for greatly increasing the farming area.

DAIRYING

Ernest Kelly

The Milk Supply.—Continued unrest agitated the milk market during the year. Producers asked higher prices, claiming increased cost of labor, feed, etc. The milk dealers' charge for handling and delivery was also raised because of similar conditions, such as higher prices for equipment, coal, power, labor, refrigeration, bottles and other supplies. These increases resulted in a higher price of milk to the consumer, which met with strenuous objection. In no recent years have both the wholesale and retail prices of milk been so high. In some instances producers received as high as 12 or 13 cents a quart for milk shipped in bulk to dealers, a price higher than obtained two or three years ago for milk pasteurized, bottled and delivered to the consumer. Consumers paid as high as 17 or 18 cents a quart for ordinary grades of milk, and special grades sold up to 30 cents a quart.

An amazing situation developed during the year. In the spring the country witnessed probably the greatest milk surplus in history. Within six months there was probably the greatest national shortage ever experienced. The surplus was due to increased production stimulated by higher prices in the preceding year; to decreased consumption because of high prices; and to the cutting down of shipping space for food to provide for the transportation of more soldiers. The shortage was brought about by an increase of available shipping, an increase in consumption, and purchases of dairy products for the Army.

Cost Investigations. — The rapid fluctuations in prices and quantity stirred up numerous investigations, resulting in the formation of regional and localized commissions to deal with the question. The U. S. Food Administration and its local representatives had a leading part in this discussion, and made many satisfactory adjustments between producers, dealers and consumers. Many new data were gathered and use made of information compiled by the agricultural colleges. In many sections prices to the producer were based on formulae supposed to represent the cost of production, one of the most widely known of which is the "Warren formula." This calls for the following amounts of feed and labor for the production of 100 lb. of milk: 33.79 lb. grain; 43.30 lb. hay; 10.80 lb. other dry forage; 92.20 lb. silage; 8.30 lb. other succulent feed; 3.02 hours of labor. These items represent 79.7 per cent. of the year-round cost of milk production. During the year a committee, of which Dr. Clyde L. King was chairman, presented a report to Herbert C. Hoover, U. S. Food Administrator, on "The Production, Distribution and Food Value of Milk." This committee, with the aid of expert accountants, analyzed production and distribution costs over a large area.

Milk as a Food.—There has been an awakened interest in and a greater appreciation of the food value of milk. Investigators have discovered that certain unknown substances are essential to growth and development (*A. Y. B.*, 1917, p. 653). These substances, known as "Fat-soluble A" and "Water-soluble B," are both found in whole milk, while one or both are absent or present only in small quantities in many other foods. These discoveries immediately threw light on many diseases of malnutrition. Pellagra, for example, is due to lack of proper nutrition and resulted in some 70,000 cases and 3,700 deaths in only six of the southern states where statistics were available. Dr. Joseph Goldberger, of the U. S. Public Health Service, probably the foremost investigator of this disease, says, "The suspicion of pellagra may be with confidence dismissed in one who is known to be, and to have been, a habitual milk drinker and meat eater." (See also XXIII, *Biological Chemistry.*)

Foreign Trade in Dairy Products.—The United States has grown to be a great exporter of dairy products. The balance of trade in this line turned in our favor in 1915, and in the fiscal year 1918 exported butter, cheese and condensed milk was equivalent to nearly two billion pounds of whole milk more than were imported. This country has turned seller instead of buyer, as indicated by the following figures of the balance of trade in butter, cheese and condensed milk (in terms of milk):

	Excess of Imports, pounds	Excess of Exports, pounds
1913........	371,081,948	....
1914........	703,444,633	....
1915........	....	211,214,747
1916........	....	751,678,803
1917........	....	1,665,542,926
1918........	....	1,929,005,344

This balance of trade in 1918 represents the milk produced by 482,251 cows of a productive capacity of 4,000 lb. of milk each.

This increase has been especially noticeable in regard to condensed milk. In 1912, 16 countries, including the United States, exported a total of 316,252,579 lb. of condensed milk. In 1918 the United States alone exported 529,750,032 lb.

Milk Supply of Cantonment Zones.—The U. S. Public Health Service, with the assistance of the U. S. Department of Agriculture, has been exercising careful supervision over the milk supplies of cantonment zones in this country. This work has protected our troops from impure dairy products not only in the camps but in neighboring towns which soldiers may visit. In addition to sanitary supervision, successful efforts have been made to increase the supply of dairy products in such territories.

Cattle Feed.—There has been considerable complaint throughout the country of the high prices and apparent scarcity of grain and mill feeds for cattle. Farmers in some sections have stated that the dairy business is in a precarious position on this account. To a certain extent there has been a regulation of prices which has prevented extremes which might otherwise have occurred. There has been also definite regulation of prices of mill feeds and profits which could be taken therewith.

Dairy Manufactures.—The manufacture of butter and cheese has not been affected by any marked changes from the previous year, although the Army has entered the market on a larger scale than ever before. The manufacture of condensed and evaporated milks has grown enormously. In the main this is due to two important factors; first, the Army has required vast quantities, and many soldiers who in civilian life consumed fluid milk now use condensed; second, there has been less fluid milk in other countries due to a decrease in dairy cattle, and this deficiency has been partly met by shipments of condensed milk from the United States. There has been an increase in the number of factories making so-called "foreign" cheeses. Cutting down the importation of these varieties has stimulated home production, especially of the Italian, Greek and Scandinavian types of cheese. The manufacture and use of powdered milk has expanded enormously. Machinery has been perfected to reconstitute milk by using milk powder, water and butter. Such reconstituted milk, if carefully handled, appears to be of good quality from sanitary and nutritional standpoints. Hospital ships have been equipped with the necessary machines so that fluid milk is available at sea. Considerable shipments of milk powder have been made to Europe. A saving in cargo space is effected by shipping milk powder rather than condensed milk.

LIVE STOCK

F. R. MARSHALL

Pork Production and Prices.—Developments of 1918 in connection with production and prices of meat animals were of deepest significance. The outcome of efforts to increase production and at the same time stabilize prices, apart from their relations to war trade, clearly set forth important facts in connection with the trend of our national agriculture and with the economic question of domestic supply and price for meats.

The United States, and chiefly its large corn-growing states, constitutes the world's chief source of exportable pork products. Our exports of pork products to the Allied countries and European neutrals in the three pre-war years averaged 820,806,000 lb. In 1916-17 the amount was 1,498,302,000 lb., and in 1917-18, 1,719,701,000 lb. The latter years' increased exports were secured from a lessened rate of slaughter resulting from conditions of the year 1916. The number of hogs slaughtered under Federal inspection in 1917-18 was 35,449,000, about 12 per cent. less than during the preceding corresponding year.

On Nov. 3, 1917, the Food Administration announced its intention to endeavor to maintain a sufficiently high price for live hogs to give assurance to producers of a profit from feeding corn that was readily convertible into cash at high prices. It was to be the endeavor to maintain the average live-weight price per hundredweight for hogs at 13 times the average local market value of a bushel of corn during the time the hogs were fed. This price was to be standard for pigs farrowed in 1918, a large production for that year being needed for Allied and neutral European countries, and for the American Expeditionary Force. From the time of the announcement to the marketing of the 1918 crop of pigs, it was to be the object to hold prices at or above a minimum price of $15.50 per hundredweight. The Food Administration's power to influence prices resided in its execution of buying orders on American and foreign Government contracts, and to some extent in restriction of packers' net profits. It was not a guaranteed price.

With the short supply of hogs from the 1917 crop and strong export and home demands, the minimum price was practically maintained at all times and exceeded in most months. On Sept. 16, 1918, light-weight hogs sold at $21.00 per hundredweight on the Chicago market. On Sept. 23, the Live Stock Committee of the Agricultural Advisory Committee (advisory to the Department of Agriculture and the Food Administration), in session with the Food Administration officials, altered the method of computing the price from the 13 to 1 ratio, deciding that the average price for packers' droves during October should be $18.50 per hundredweight. Later, representatives of 50 packing firms, to whom instructions were issued regarding the October price, reported to the Food Administration regarding difficulties in following such a course and expressed apprehension of an outcome detrimental to consumers. Accordingly, the price on the Chicago market was maintained at $17.50 during December, and this was agreed upon for the month of January, 1919. The minimum weight to which this price was to apply was 150 lb. live weight, as packers could not use lighter hogs in filling foreign orders.

Either as a result of the large (but to a considerable extent immature) corn crop of 1917, or of the assurance as to price and the activities of Federal and state agricultural extension agencies in presenting and explaining the situation, or in response to both factors, Sept. 1 estimates showed an increase of 8.1 per cent. in the number of stock hogs in the country as compared to the same date one year earlier. The increased figure, however, was not above that for Sept. 1, 1916.

Beef Cattle.—No attempt was made to control prices of beef cattle. In the early months of the year liberal supplies of corn-fed stock continued to reach the markets from sections where the feeding of stock was rendered imperative by the soft and unmarketable condition of the corn crop. There was considerable complaint from shippers whose returns from their cattle fell below the combined value of the feed used and the original purchase price of the cattle. Lessened supplies later on brought higher prices, and on Oct. 2, $19.60 per hundredweight was paid on the Chicago market for a carload of 1,017-lb., well finished, yearling Shorthorn steers.

Large supplies of thinner cattle were marketed during the summer and fall months as a result of drouth in southwestern and parts of western range states. Considerable numbers of cows, desirable for breeding purposes, were sold at from $6.00 to $7.00 per hundredweight for canning purposes. Army and Navy contracts being closed to beef from cows and heifers, competition for these was limited to concerns supplying civilian trade, and highest prices for cows and heifers were about $4.00 per hundred less than for steers of similar quality, as compared with an ordinary difference in price of from $1.00 to $2.00 per hundred.

The combined Federal-inspected slaughter of cattle and calves in the year 1917-18 was 14,261,000, as compared to 11,979,000 during the preceding year. In the first eight months of 1918 (calendar year) the number was 9,354,000, as against 8,131,000 in the corresponding part of 1917.

The data for 1909 (published in the 1910 census) showed the ratio of Federal-inspected slaughter of cattle (not including calves) to be 56.67 per cent. of the total slaughter. Estimates made by the Bureau of Animal Industry in 1918 make it appear that at present the Federal-inspected slaughter of cattle amounts to about 75 per cent. of the total.

Exports of beef products to the Allies, neutrals, Belgian Relief Commission and American Expeditionary Force in 1917-18 amounted to 662,354,000 lb., as contrasted to 405,427,000 during 1916-17 and a three-year pre-war average of 150,333,000 lb.

Regulation of Stock Yards.—That progress is being made in the problem of distribution of meat is shown by new movements inaugurated by some of the larger packing concerns which have been unwilling heretofore that their business should be in any way regarded as a public utility. One concern has made large use of advertising in daily papers to explain to the public some of the phases of the meat business not often understood or appreciated by consumers. In October the manager of another concern met 35 editors of agricultural papers and stated that his company had decided upon a new policy, and would hereafter attempt to have its business understood by producers and consumers, as a means of promoting a better understanding of the packing business in its relation to the growing problem of supply and price of meat.

As a part of the plan for regulation of the meat supply in the interests of producers and consumers during war time, a Presidential proclamation, authorized by Act of Congress of Aug. 10, 1917, was issued on June 18 requiring the licensing of companies operating stock yards or firms doing business at such yards. Licenses were required to be procured by July 25. The proclamation related specifically to stock yards for live cattle, sheep, swine and goats, and to traffic in these at such yards. The carrying out of the provisions of the proclamation was placed in the hands of the Secretary of Agriculture and licenses were issued by the United States Food Administration.

Wool.—In April the War Industries Board announced its intention to take control of all domestic wools. Earlier steps had reserved to the Government options on such imported wools as were required for its uses. Under the new plan all wool of the 1918 clip was to go into the hands of Government authorities on the basis of prices current on July 30, 1917. Small clips might be bought outright from growers by local dealers, who were limited as to the advance in price at which their purchases might go to larger concerns making deliveries to the Government. Large clips were consigned by growers to concerns making deliveries to the Government, and receiving for their services not more than 1½ cents per pound. Such wools as were not required for use on Government contracts were distributed among mills manufacturing for civilian trade. This plan temporarily resulted in a large reduction in the amount of wool available for certain uses until released after the armistice by auctions at market centers.

VETERINARY MEDICINE

WILLIAM A. HOOKER

The Veterinary Profession and Veterinary Education.—The fifty-fifth annual meeting of the American Veterinary Medical Association was held at Philadelphia Aug. 19-22, with a considerably decreased attendance due to the large number of members engaged in war work. The officers elected were: Dr. V. A. Moore, Ithaca, N. Y., president; Dr. N. S. Mayo, Chicago, secretary; and Dr. M. Jacobs, Nashville, Tenn., treasurer.

The Association's committee on intelligence and education recommended that for the session of 1918-19 the requirements for entrance into veterinary schools be two years of high-school work or an equivalent in academic training, three years of high-school work for the following year, and four years beginning in the fall of 1920; these recommendations were adopted. The conditions brought about by the war resulted in the discontinuance of four private schools, including the Kansas City Veterinary College, which has had the largest attendance of any veterinary college in the United States.

The service of the veterinarian in the war was reviewed at the meeting of the Association by Dr. J. R. Mohler, successor to the late Dr. A. D. Melvin as chief of the Federal Bureau of Animal Industry; he stated that during the year the Bureau had furloughed 355 veterinarians for military service, and that it is producing from 30,000 to 40,000 doses of mallein monthly for the War Department. Upon the induction of Dr. P. A. Fish into the military service, Dr. W. H. Dalrymple of the University of Louisiana became editor of the *Journal of the Association.*

Necrology.—The close of the year 1917 and the beginning of 1918 saw the passing of several of the older veterinarians who have been leaders in the advancement of veterinary education in the United States. On Dec. 7, 1917, Dr. A. D. Melvin, chief of the Federal Bureau of Animal Industry since 1905, died at Washington at the age of 55. On Feb. 7 the death of Dr. Sesco Stewart, for twenty-five years dean of the Kansas City Veterinary College, took place at Kansas City at the age of 63. In the passing of Dr. Alexander F. Liautard, whose death took place at Boise Jerome, France, on April 20 at the age of 84, the veterinary profession lost its dean.

Legislation and Regulation.—The Agricultural Appropriation Act included special appropriations for disease-eradication work: for the eradication of cattle ticks, $750,000, of which $50,000 is to be used in live-stock and dairy demonstration work; for hog-cholera work, $446,900, of which $167,240 is to be used for enforcement of the serum-virus-toxin Act; for dourine work, $97,800; and for tuberculosis control and eradication, $500,000. An emergency appropriation of $1,000,000 was made available for use in case of another outbreak of foot-and-mouth disease or other contagious diseases of live stock. The emergency Food Stimulation Act of Nov. 21 (see *Agriculture, supra*) included additional appropriations of $61,610 for tick-eradication work and $202,965 for hog-cholera control work.

Tuberculosis.—With the publication on July 1 of a first list of 23 pages of herds officially accredited as free from tuberculosis, the first milestone was passed in the great and far-reaching work being undertaken by the Federal and state Governments in eradicating this disease from American live stock. This work, which includes that being carried on in several counties in six or more states with a view to completely eradicating tuberculosis from live stock in such areas, is now under way in 34 states.

Tick Eradication.—The work of eradicating the cattle tick was pressed with great vigor during the year, and on Dec. 1 an area of 79,217 sq. miles in nine states was released from quarantine. Included in this release were the ten counties remaining in South Carolina. Under the state-wide tick eradication law passed by Louisiana in 1917, which became effective in April, extensive work was carried on with encouraging results. Up to Dec. 1, 458,529 sq. miles of territory in 15 states had been freed from ticks, or 63 per cent. of the area infested in 1906.

Hog Cholera.—Under the increased appropriation by Congress the hog-cholera control demonstration work was extended to include 34 states. The protection provided to the swine industry aided greatly in bringing production to the highest point in the history of the industry (see *Live Stock, supra*), thus providing the Allies with an increased food supply. The loss has been reduced from 119 hogs per thousand in 1914 to 42 per thousand in 1917, or in value from $75,000,000 to $32,000,000. The mortality due to hog cholera in 1917 was the lowest ever recorded by the Federal Bureau of Crop Estimates. On March 31, 1918, there were on American farms 74,324,000 hogs, valued at no less than two and one-half billion dollars, by far the greatest number ever produced in a single year.

Sheep and Cattle Scab.—The work with sheep scab is progressing rapidly, 118,033 sq. miles under quarantine in 136 counties having been released on April 15, leaving but 11 counties in Texas, 10 in California, and three in Louisiana, or an area of 56,284 sq. miles, still under quarantine for scab. With the release on April 15 of 3,817 sq. miles in Texas, all of the 1,269,844 sq. miles placed under quarantine for cattle scab in 1905 has now been released. In this work approximately 50 veterinarians were engaged; 19,630,126 field inspections and 5,585,543 dippings were made of sheep and 1,829,532 inspections and 642,831 dippings made of cattle during the fiscal year.

Dourine.—Dourine-eradication work was carried on in seven states, 45,651 stallions and mares being tested during the fiscal year, of which only 2.23 per cent. gave positive reactions.

Ascarids.—In the field of parasitology a most important discovery has been made by Stewart, who finds *Ascaris lumbricoides*, which infests man and swine, to have a direct life cycle. That no intermediate host is required has been determined also by Ransom and Foster. The eggs, when swallowed by the pig, hatch in the alimentary tract, the embryos migrate, and within a week may be found in the liver, spleen and lungs. They later regain the alimentary tract, migrating by way of the lungs and the trachea through the pharynx into the esophagus. Heavy invasions of the lungs by the larvae produce a serious pneumonia which is frequently fatal in rats and mice, and apparently causes the death of a young pig one week after it has been fed with numerous ascarid eggs. Ransom and Foster consider it not improbable that the ascarids are frequently responsible for lung troubles in children and in pigs and other young animals.

DISEASES OF PLANTS

Walter H. Evans

Societies and Institutions. — The ninth annual meeting of the American Phytopathological Society was held at Pittsburgh on Dec. 28, 1917, to Jan. 1, 1918. The Pacific division of the Society met at Berkeley, Cal., on March 30. The fourth annual Conference of Cereal Pathologists was held at LaFayette, Ind., on June 19-21. A Phytopathological Society has been organized in Japan, and it has begun the publication of a journal entitled, *Annals of the Phytopathological Society of Japan.* Contributions are printed in English and Japanese. Dr. Byron D. Halsted, one of the American pioneers in plant pathology, died at New Brunswick, N. J., on Aug. 28.

Legislation and Regulation. — The Act of Congress making appropriations for the U. S. Department of Agriculture for the year ending June 30, 1919, specifically provides more than $1,089,000 for the investigation and control of plant diseases. In addition, the emergency Act designed to stimulate agriculture and conserve its products (see *Agriculture, supra*), carries appropriations amounting to $298,550 for work in plant-disease control. Among the new items provided for are: for the investigation and control of the black rust and stripe rust of wheat, oats and barley, $100,000; for the eradication of plants which serve as alternate hosts for the black-rust fungus, $150,000; for the investigation and control of root and stalk diseases of corn, $25,000; for cereal smut eradication, $110,000; for investigations of sugar-beet nematodes and their control, $10,000; for an investigation of a new sugar-cane disease in Porto Rico, $20,000. For carrying out the provisions of the Federal Plant Quarantine Act an appropriation of $74,800 was made for the fiscal year 1919. Under authority of Congress regulations were adopted on Oct. 31, 1917, establishing a market inspection service for food products in 26 of the larger cities of the United States; for the present fruits and vegetables are being inspected for soundness. The service is to be extended to other cities as rapidly as possible. A quarantine against the introduction into the United States of all seeds, plants, and cuttings of bamboo on account of the bamboo smut (*Ustilago shiriana*) became effective on Oct. 1. Minnesota has recently required the destruction of all plants of the common barberry (*Berberis vulgaris*), which is an alternate host of the common rust of wheat and other grains.

War Work of Plant Pathologists.—At the Pittsburgh meeting of the Phytopathological Society, in response to a resolution providing for the mobilization of American botanists, a War Emergency Board was appointed, composed of Prof. H. H. Whetzel of Cornell University and a commissioner from each of six districts into which the country was divided, one at large and one from Canada. The underlying idea of this organization is concentration on problems of vital importance in connection with food production. A census was taken of available plant pathologists, and conferences were held at Washington, Boston, Buffalo, LaFayette, Ind., Lincoln, Neb., Atlanta, Ga., and Berkeley, Cal. These were largely attended and plans for procedure were arranged. Efforts have been concentrated on the investigation and control of diseases of cereals, potatoes, truck crops, and fruits, the methods adopted for reducing crop losses being seed selection, seed treatment, and the proper use of spraying materials. In coöperation between the various states and the U. S. Department of Agriculture, most of the plant pathologists of the country were engaged in this work during the season of 1918. Meetings were held and demonstrations conducted to show the possibility of increased crop production through the elimination of preventable losses due to plant diseases.

Plant Disease Survey.—One of the problems emphasized by the War Emergency Board was a comprehensive estimate of losses due to plant diseases. This was taken up by the Plant Disease Survey organized in 1917 by the U. S. Department of Agriculture. Some idea of the need for conservation work on plant diseases may be gained from the reported losses to several of the leading crops, the estimated losses for the United States in 1917 being: wheat, 64,227,000 bus.; rye, 2,685,000 bus.; barley, 12,252,000 bus.; oats, 154,120,000 bus.; corn, 175,368,000 bus.; potatoes, 117,167,000 bus.; sweet potatoes, 41,706,000 bus.; cotton, 1,866,000 bales; and sugar beets, 816,786 tons. It is definitely known that a large reduction of these losses could have been effected by the application of means well known to plant pathologists but which the public seems slow to adopt. During 1918 the Plant Disease Survey has conducted a survey of the diseases of economic plants in the United States, special attention having been given to certain crops. In coöperation with the Market Crop Inspection, data are being collected which show very great losses through faulty packing, handling, etc. The survey has also shown the presence of some diseases not hitherto known to occur in the United States and a wide distribution of others previously known in only a few localities.

Cereal Diseases.—One of the largest enterprises undertaken has been an attempt to reduce loss due to the black, or stem, rust of grain through the destruction of the common barberry, which serves as the æcidial host of the rust (*Puccinia graminis*). This work was begun in the spring of 1918, and public sentiment has brought about the abandonment by many nurserymen of the sale of the common barberry. The Japanese barberry is said not to harbor the rust. The bacterial disease of wheat known as black chaff, reported last year (*A. Y. B.*, 1917, p. 451), has been found to be quite widely disseminated in the United States. As a result of the Plant Disease Survey, the Physoderma disease of corn has been found abundant, especially in the South; in Georgia losses amounting to 10 per cent. of the corn crop are reported. Root rots of corn, due in many instances to species of Fusarium, are said to be the cause of much damage to the crop. The rice disease known in India as "ufra" has been shown to be due to the nematode *Tylenchus angustus.* The cause of a bacterial disease of barley has been described by Jones and his coworkers. The organism *Bacterium translucens* is distributed through the sowing of affected seed grain.

Forest-Tree Diseases.—In the attempt to control the white-pine blister rust, in addition to quarantine measures previously noted (*A. Y. B.*, 1917, p. 451), an active campaign in eradication is being carried on, and it is reported that of the 71 localities where the disease appeared within the past six years, it has been eradicated from all but three. A poplar canker due to *Cytospora chrysosperma* has been reported by Long as destructive to poplars and willows in some western states. The poplar canker caused by *Dothichiza populea* seems to be unchecked, and it is said to have destroyed many trees in New York and the vicinity. The chestnut canker continues to spread, practically all important chestnut areas having been invaded.

Diseases of Fruits and Fruit Trees.—Miss Doidge has described from South Africa a bacterial blight of pear trees due to *Bacterium nectarophilum,* and a bacterial spot of oranges caused by *Bacillus citrimaculans.* Both diseases are considered distinct from similar diseases in this country. In the south of England, a species of Monilia is reported to cause a wilting of the blossoms and a form of canker on the limbs of apple trees. McAlpine has concluded his investigations of apple bitter pit in Australia, having found the disease due to a rupture of the outer cells of the fruit through increased pressure of the sap. Investigations in Oregon have substantiated this conclusion, it having been found there that heavy irrigation generally increases bitter pit in apples. A severe drop of navel oranges in California was reported by Coit and Hodgson as due to a deficient water supply during a prolonged period of high temperature. Shear has found an end rot of cranberries due to *Fusicoccum putrefaciens* prevalent in all cranberry regions of the United States. It seems capable of control by the use of Bordeaux mixture.

Miscellaneous Diseases.—One of the most important discoveries of the season was the finding in Luzerne County, Pa., of the black-wart disease of potatoes due to the fungus *Chrysophlyctis endobiotica.* This is one of the most serious potato diseases of Europe, and it is believed to have been brought to this country in a lot of potatoes imported in 1912, some of which were used by miners in Luzerne County. An investigation in September, 1918, showed the disease present in about a dozen villages in the county, but it is not known to exist in any other locality in this country. A Phoma disease of potatoes was reported as quite destructive to potato plants in Long Island and parts of New England during the summer of 1918. Carpenter in Hawaii has discovered a mite disease of potatoes that is very destructive, but which fortunately yields to applications of fine sulphur. A sugar-cane disease characterized by mottling of the leaves, dwarfing of the plant, and reduction of the sugar content, is reported from Porto Rico, where it is said to threaten the sugar industry. A special investigation of this disease has been begun.

ECONOMIC ENTOMOLOGY

William A. Hooker

The Entomological Profession and War Service.—At the thirtieth annual meeting of the American Association of Economic Entomologists, held at Pittsburgh, E. D. Ball of Wisconsin was elected president, and A. F. Burgess of Massachusetts, secretary-treasurer.

There was close coöperation during the year between the several divisions of the Federal Bureau of Entomology and the state and experiment station entomologists. Emergency reports were issued which included reports of the prevalence, distribution, and severity of insect attack throughout the country. Extension entomologists to the number of 48 worked in at least 22 states. Inspections were made of food products to be shipped to France and at Government storehouses, and advice given as to the prevention of loss from insect infestation. A course on the entomology of insect-borne diseases and sanitation was given by the Federal Bureau of Entomology to some 600 entomologists and sanitarians, and was relayed by 25 colleges and universities. A number of entomologists were commissioned; they, together with a large number of enlisted entomologists, were engaged in insect-control and sanitation work at camps. A most important service rendered was that relating to the body louse or "cootie," including investigations of its biology and control. This work was carried on through the medical and related science division of the National Research Council by a committee of entomologists headed by Dr. L. O. Howard.

Legislation and Regulation.—The Agricultural Appropriation Act approved on Oct. 1 carried appropriations for the Bureau of Entomology of $968,680; for the enforcement of the Insecticide Act, $121,240; and for the Federal Horticultural Board, $74,800. In addition, $500,000 was appropriated for investigation and control work on the pink bollworm of cotton, including $25,000 for a survey of its distribution and extermination near the border in Mexico, $25,000 for investigation as a basis for control work, and $50,000 for inspection, disinfection, etc. An appropriation of $20,000 was made available for coöperative control work against the sweet-potato weevil in such states as may appropriate for the work. The emergency Food Stimulation Act approved on Nov. 21 contained an additional appropriation of $210,000 for insect investigation and control work and $15,000 for bee-keeping extension work.

In order to prevent the introduction of a number of foreign insect pests, quarantines were established during the year against the sweet potato and yam to prevent the introduction of the sweet-potato weevil (*Cylas formicarius*) and the sweet-potato scarabee (*Euscepes batatae*), and against banana plants or portions thereof to prevent the introduction of the banana root borer (*Cosmopolites sordidus*) and another weevil (*Rhabdocnemis obscurus*). That the spread of two recently introduced pests might be prevented, an embargo effective on Oct. 1 was placed on the movement of the corn plant and its products from the territory in eastern Massachusetts infested by the European corn borer (*Pyrausta nubilalis*), and another embargo effective on June 1, 1919, against the movement of green corn (sweet or sugar corn) from the three infested townships of Burlington County, N. J., to prevent the spread of the Japanese beetle (*Popilia japonica*).

Pink Bollworm of Cotton.—Late in 1917, following the discovery of an infestation at Hearne, Robertson County, Tex. (*A. Y. B.*, 1917, p. 453), the pink bollworm of cotton was found at Beaumont, Jefferson County, where 114 carloads of seed from Mexico had been received. Shortly after its discovery in Jefferson County, it was detected at Anahuac, Chambers County, and around Trinity Bay as far as Galveston County; this infestation was determined to have originated in Mexican cotton washed ashore from Galveston wharves in the great storm of August, 1915.

In the eradication work, an area of 1,624 acres in the vicinity of Hearne and 7,170 acres in southeastern Texas was cleared of all cotton by burning with the aid of oil, under authority of an act passed by the Texas legislature in 1917. The governor quarantined all the infested territory, including a safety zone approximately 10 miles in width on the outermost points infested in southeastern Texas and a zone extending three miles from the mill at Hearne, and prohibited the planting of cotton in the quarantined area. The finding of the pink bollworm in Mexico not far from Del Rio in the spring of 1918 made it necessary to place in operation another section of the act, and a third non-cotton zone was established to include the counties of McKinney, Maverick and Valverde. In a test made of the validity of the act, it was upheld by the Texas courts.

The fact that not a single pink bollworm was found in 1918 in the territory in Texas infested in 1917 is an indication of the thoroughness of the eradication work. As illustrative of the great damage that this pest occasions, mention may be made of a report of the American vice-consul at Rio de Janeiro that the Brazilian Government has estimated the annual loss occasioned in that country at $27,500,000. Investigations of the biology, distribution, etc., of this bollworm in Mexico were carried on by the Bureau of Entomology.

European Corn Borer.—The widely distributed European and Asiatic pest *Pyrausta nubilalis,* a moth whose larva is a borer,—was discovered by Vinal late in 1917 to have become established in an area of approximately 100 sq. miles in several counties in eastern Massachusetts, where it is a cause of serious injury to corn. With the exception of the leaf blades, the whole corn plant above ground is subject to the attack of this voracious caterpillar. Its most serious injury to the crop is caused by the second-brood larvae, a large percentage of which immediately enter the ear after hatching, their injury resembling that of the well known corn earworm. This pest is thought to have been introduced in a consignment of hemp shipped to a cordage company in the vicinity of Boston.

Cotton Boll Weevil.—The severe weather during the winter of 1917-18 gave the cotton boll weevil such a setback that it only about regained its lost territory, although there was a slight advance in one county of South Carolina opposite Savannah. Its greatest injury was caused in the coastal and delta regions. The observations of Coad of the Federal Bureau of Entomology that the adult boll weevil drinks regularly from the rain or dew collected in droplets on the leaves of the cotton plant led to experiments which show that it can be destroyed by poisoning such water through the application of an arsenical-dust spray, and that this is a practical means for its control.

Castor-Bean Injury.—The great demand for castor oil for airplane lubrication led to the planting of an enormous acreage of castor beans (see *Agriculture, supra*), and hordes of native insects turned their attention to it with great loss, particularly in Florida. Among the more important pests causing the injury were the subtropical and the fall army worms, and a lace-wing bug.

Semitropical Army Worm.—An unprecedented outbreak of *Prodenia eridania* took place on the east coast of Florida from St. Augustine to Key West, and entire fields of castor beans, of which there were 40,000 acres in the state, sweet potatoes, cotton, peppers, sunflowers, etc., were destroyed. Through the coöperation of the War Department with the Department of Agriculture several tons of arsenate of lead were shipped to Florida for use in the control of the pest.

Insecticides.—Investigations by DeSellem in Washington and Lovett in Oregon have shown that nicotine-sulphate is as effective as lead arsenate in codling-moth control, and in addition keeps trees free from plant lice and other sucking insects. The addition of soap to the nicotine-sulphate solution renders it practically perfect as an ovocide for codling-moth eggs, and observations indicate that the nicotine acts as a material check to the spread of the San José scale. In tests by Lovett of spreaders for arsenate sprays, sage tea and a casein-lime mixture gave the least burn and approximated the ideal sought for.

Bacot found that stearin, which melts at 140° F., is a satisfactory indicator of the amount of heat and length of time required for destroying lice and nits in clothing and blankets. The exposure has been sufficient by the time seven grams of stearin has melted when placed in a pot hung below the lowest garment in a sterilizing room. Work by Hartzell shows that when molasses is to be used with arsenate of lead, as in the control of the rose chafer and grape rootworm, the application should be made at a time when freedom from rain is to be expected for at least three or four days. Woglum called attention to the fact that trees, the branches of which have been sprayed with Bordeaux mixture or painted with Bordeaux paste, should not be fumigated with hydrocyanic acid gas as a serious burning will result from its use. That nitrobenzol cannot be used with any degree of safety in fumigating animals to destroy their external parasites was determined by Chandler.

Moore and Graham found that kerosene varies greatly in its physical characteristics and chemical composition even when coming from the same oil field. High boiling point compounds are more toxic than low boiling point compounds when used as contact insecticides in the form of an emulsion. The investigations of Moore led to the preparation of nicotime oleate, which is a very effective insecticide and much cheaper than free nicotine sprays. Vinal found linseed-oil emulsion most satisfactory for the destruction of all stages, above the egg stage, of the greenhouse red spider. Bishopp and Wood found sodium fluoride, when used as a spray in the proportion of 0.5 oz. per gallon, to destroy all stages of biting lice on cattle and to be effective when used as a dust mixed with flour in the proportion of 1:5. Moore found chlorpicrine, used at the rate of 0.5 to 1 lb. per 1,000 cu. ft., to destroy insects which require 3 to 8 lb. of carbon bisulphide. While it is more liable to injure the germination of seed, dry grain is not injured when normal doses are used and a thorough airing follows.

Morrill found that for use in grasshopper baits cantaloupe is equal to lemon in attractiveness, and that a mixture of pine sawdust and bran, half and half, in the standard formula reduces the cost 20 per cent. and gives as good results as the all-bran combination. Investigations by Gray led to the recommendation of the use of powdered glue in the preparation of wettable sulphur. A summary of control measures for the body louse was published by Nuttall. A valuable submersible automatic oil bubbler, which takes in water and displaces the oil, was invented by Ebert for use in mosquito control. It has been found that sawdust impregnated with crude oil will hold the oil for a long time and slowly give it up to the water. (See also XVI, XXIII, *Agricultural Chemistry.*)

New Disease of the Gipsy Moth.—A new disease of gipsy moth caterpillars from eggs originating in Japan was described by Glaser as due to *Streptococcus disparis* n. sp. In field experiments success was met with in reproducing the disease.

AGRICULTURAL LEGISLATION

H. L. Knight

Federal Legislation.—The year 1918 was exceptional for the absence of any distinctively agricultural measure of importance other than the annual Appropriation Act for the support of the Federal Department of Agriculture, and the supplementary Emergency Agricultural Appropriation Act, which became law on Nov. 21. Both of these measures are discussed elsewhere (see *Agriculture, supra*). There was, however, a large amount of general war-emergency legislation which affected agriculture very intimately in its operations. Thus, from an appropriation of $50,000,000 made on July 1 for the promotion of the national security and defense, a fund of $5,000,000 was drawn upon for small loans to farmers in drouth-stricken areas for the purchase of seed grain. These loans were to be made through the Federal land banks, following certification of approval by representatives of the Federal Department of Agriculture. Under the regulations adopted applicants are required to use seed and methods approved by the Department and to execute the necessary guaranties, notes, chattel mortgages, etc. Similarly, under the War Finance Corporation Act (see XIII, *Banking and Currency*) plans have been made for direct loans to stockmen. Two branches of the Corporation, known as cattle loan agencies, were established at Kansas City, Mo., and Dallas, Tex., for this specific purpose. The Federal Farm Loan Act of 1916 was amended to permit purchases by the Government itself in 1918 and 1919 of the farm-loan bonds of the various land banks to the amount of $100,000,000 in each fiscal year. This action was expected to facilitate the financing of loans to farmers under the Act (see also XIII, *Banking and Currency*).

Under the amendment to the Selective Service Act (see I, *American History*) agriculture was again specifically included in the occupations in which persons could be exempted from military service. Provision was made in the scheme of classification of registrants for the deferred classification of heads of necessary agricultural enterprises, assistant and associate managers of such enterprises, and skilled farm laborers when engaged in such work, these groups being placed respectively in Classes 4, 3, and 2. Authority was also granted by Congress to furlough men in the National Army to return to the farms for brief periods. An act was passed permitting homestead settlers and entrymen on the public lands to leave their holdings during the war for farm labor elsewhere. The time spent in this labor is to be counted, under certain regulations, as constructive residence in perfecting their homestead claims (see also IX, *Public Lands*).

State Legislation: War Legislation.—The legislatures of most of the states were not in session in 1918, so that the volume of legislation was much smaller than in the preceding year. A fund of $200,000 was provided by the Territorial Legislature of Hawaii as a revolving fund to stimulate the production of taro, rice and other food products for local consumption. The governor was empowered to fix by contract with producers a minimum price for these commodities. Massachusetts appropriated $300,000 to stimulate the production and conservation of foodstuffs, as well as $100,000 additional for the purchase and operation of tractors and other farm machinery, and authorized the use of county prisoners in farm work. Railroad rates on agricultural limestone were prescribed in Kentucky for the period of the war.

Agricultural Credit.—Several states authorized loans to farmers for seed grain and similar supplies. The North Dakota law attracted particular attention. Under its provisions counties are empowered to purchase and sell seed grain and feeds at cost to needy farmers whenever crops have been a partial or complete failure, taking as security contracts which constitute a first lien on the crop. In case the applicant is also owner of the land on which the crop is grown, there is also a lien on this property which has priority over all encumbrances except those existing at the time the act became effective. This latter provision was causing much difficulty in securing other loans on real estate, particularly under the Federal Farm Loan Act.

In Montana, counties were authorized to issue bonds to supply seed grain to needy farmers, taking a lien on the crop as security or eventually collecting the debt as taxes on all property. A state fund of $500,000 was also provided for loans to farmers for seeds, live stock, labor, marketing, and similar needs, liens and mortgages being taken as security.

Marketing Farm Products. — The most comprehensive marketing legislation of the year was in North Dakota, where the state commissioners of railroads were empowered to establish and operate central grain markets at strategic points outside as well as within the state. A state grain-grading system was adopted and provision made for grain and warehouse inspection. Grain-grinding tolls were prescribed in Virginia. The Virginia law regulating commission merchants was considerably amended, and a new law requiring the bonding of commission merchants enacted in Louisiana.

Inspection and Other Regulatory Laws.—New codes relating to the inspection of dairies, creameries, Babcock apparatus, dairy by-products, etc., were adopted in Arizona, Kentucky and Mississippi. In the state last named the pasteurization of all milk and cream used for creamery butter was required. Massachusetts and Rhode Island amended their milk laws, the former as to milk grading and the latter quite extensively. In New Jersey licensing and bonding of milk and cream dealers were made obligatory. The use of milk and cream cans without the owner's permission was made a misdemeanor in South Carolina.

Additional steps were taken in several states for the further control of animal diseases. Mississippi prohibited the running at large of tick-infested stock, and passed a comprehensive law to combat animal tuberculosis, including compensation for diseased animals. The use of tuberculin, serums and analogous products was closely restricted in New Jersey. Kentucky, Louisiana, Massachusetts, New Jersey, and South Carolina amended their general animal-quarantine laws. Louisiana also regulated the transportation of live stock by requiring greater care of stock in transit.

A nursery-stock inspection law was passed in Mississippi along the lines of the Federal Plant Quarantine Act. Massachusetts amended its laws providing compensation to owners of currant and gooseberry bushes destroyed in combating white-pine blister rust. Apiary inspection was instituted in Kentucky.

A new seed law, conforming closely with the uniform bill approved by the Association of Official Seed Analysts of North America, went into effect in Maryland on Oct. 1. New standards of weights and measures were established for many farm commodities in Massachusetts and New Jersey. The apple-grading law and the fertilizer law were amended in Massachusetts. Stallion registration was begun in Kentucky and Louisiana.

Agricultural Education.—To meet constitutional changes requiring direct control by the state of all institutions receiving financial aid, the Massachusetts Agricultural College corporation was dissolved and the College reorganized as a distinctly state institution. The State Board of Agriculture, one of the oldest in this country, was succeeded by a State Department of Agriculture. Organizations receiving state aid for extension work were also reorganized.

A system of agricultural scholarship in the state university, defrayed from local funds, was authorized in Louisiana, the beneficiaries agreeing to return home upon graduation and farm for two years.

The teaching of agriculture was required in rural schools in Kentucky after July 1, 1919, under teachers passing examinations in the subject. In Mississippi, graduates of agricultural high schools were granted teachers' licenses without examination under certain conditions, among them the immediate taking of work in an approved summer school.

Miscellaneous.—A commission to study the problem of encouraging sheep raising was authorized in Massachusetts. To the same end a more stringent dog law was passed in Kentucky. The same state provided for the registration of farm names. Montana further regulated the issuance of hail insurance. Louisiana provided for the incorporation of distinctly agricultural, live-stock, dairy, or horticultural coöperative associations.

HORTICULTURE

E. J. Glasson

Crop Conditions.—Although the condition of crops in 1918 suffered in certain sections from inclement weather and crop pests, the total production of fruits and vegetables was somewhat greater than in 1917. Notable shortages were the orange crops of California and Florida and the peach crop throughout northern and middle-western states. September rains materially reduced the production of dried fruits in California, and the white potato crop in the Northeast was reduced by frost, blight, and other troubles. As in the preceding year, market prices were not a true index of production, since prevailing labor and transportation conditions made it extremely difficult to harvest and to distribute the crops where they were most needed. The war-garden campaign (*A. Y. B.*, 1917, p. 458) was continued on even a larger scale than in 1917, and resulted in an enormous addition to the country's supply of fresh, dried, and canned vegetables. Owing to the sugar shortage, conditions were very unfavorable to the conservation of large home supplies of fruits.

The commercial apple crop was estimated at about 24,000,000 bbl., as compared with 22,000,000 bbl. in 1917. Owing to a serious heat wave during the summer of 1917, California shipped only about 24,000 cars of citrus fruits in the 1917-18 season, as compared with 54,300 cars in 1916-17. On the other hand, deciduous fruit shipments from that state for 1918 amounted to 27,500 cars, of which more than half were grapes, as compared with 24,000 cars in 1917. Florida shipped about 14,500 cars of citrus fruits for the 1917-18 season. The total production of peaches was 40,000,000 bus., and of pears about 10,000,000 bus., as compared with 45,000,000 bus. of peaches and 13,000,000 bus. of pears in 1917. The white-potato crop was estimated at 390,100,000 bus., and the sweet-potato crop at 88,000,000 bus., as compared with 442,500,000 bus. of white potatoes and 87,000,000 bus. of sweet potatoes in 1917. The fall onion crop amounted to about 15,000,000 bus., as compared with 13,000,000 bus. in 1917. The bean crop was about 18,000,000 bus., as compared with 15,000,000 bus. in 1917. About 565,000 tons of cabbage were produced, as compared with 475,000 tons in 1917. The 1917 pack of tomatoes, corn, and peas amounted to 15,076,000, 11,000,000, and 9,829,000 cases, respectively. The canned pineapple pack of the Hawaiian Islands in 1917 was 2,618,000 cases.

Foreign Trade.—In the fiscal year ending June 30, 1918, the United States exported fruits, vegetables, and nuts worth $60,934,067, as compared with $61,684,907 in 1917. We imported $107,431,859 worth, as compared with $87,331,846 in 1917. The export figures are: fruits, $32,217,364; vegetables, $26,453,389; nuts, $2,263,314. The import figures are: fruits, $24,408,777; vegetables, $30,175,769; nuts, $52,847,313. Although increased prices during the year tended to uphold the total value, there was an actual decline in shipments of fruits and of nuts. Reduced quantities of fruits and vegetables were imported in 1918 at higher prices.

Increased imports of oil-yielding nuts are again noteworthy. In 1918, 486,996,112 lb., worth $26,945,569, was imported, as compared with 247,036,099 lb., worth $12,515,712, in 1917. In addition imports of prepared coconut meat increased from 9,743,024 lb., worth $727,424, in 1917 to 20,579,973 lb., worth $2,396,104, in 1918. Cream and Brazil nuts amounting to 30,439,095 lb., worth $1,470,089, were imported, as compared with 14,627,742 lb., worth $712,433, in 1917. Imports of shelled peanuts increased from 27,180,748 lb., worth $1,193,364, in 1917 to 73,362,215 lb., worth $4,617,560, in 1918. Imports of beans, peas and lentils increased from 4,911,014 bus., worth $15,172,100, in 1917 to 6,213,697 bus., worth $23,159,576, in 1918. Exports of nursery stock were worth $260,763, as compared with $220,341 in 1917. Imports of nursery stock decreased from $3,955,709 in 1917 to $3,327,697 in 1918.

Army Supply Gardens. — Profiting from the experience of the French and British armies, the War Department perfected extensive plans during the year for providing the overseas force with an adequate supply of fresh vegetables. Men trained in vegetable growing were commissioned for this service in the Quartermaster Corps and were being sent over to France as fast as they could be obtained to work out details for the season of 1919. The general plan provided for an extensive vegetable nursery of several thousand acres, in which plants should be raised and distributed for culture by soldier labor at depots, garrisons, and behind the lines where feasible. Vegetable gardens were established at some of the cantonments in this country.

Reconstruction Work.—The curative value of gardening for disabled soldiers has been amply demonstrated in European hospitals and reconstruction centers. Both the Federal Board of Vocational Training and the Sanitary Corps of the Army are creating a staff of trained horticulturists to be located at hospitals and reconstruction centers in this country for reëducating men who have been rendered incapable of resuming the work they were engaged in prior to entering the Army. The plan is part of a broader one, providing for various lines of reëducation (see also XIV, *Vocational Education*). Such men who prefer horticulture will receive free education in various branches of the subject, pay while in training, and family allowances continued during the same period. Wounded men who can resume their former occupation but who desire to take horticulture will receive free education but will not receive pay and family allowances during the period of the course. The Government has not yet formulated a policy for getting the returned soldier on to the land, as has Canada, Australia, New Zealand, and other countries, but there is manifest at Washington a strong sentiment in favor of accomplishing this object (see also IX, *Reclamation*).

Government Dehydrating Plant.—The U. S. Department of Agriculture now maintains at the Arlington Experiment Station near Washington a dehydrating plant of commercial size. The plant was erected primarily to conduct experiments in dehydrating fruits and vegetables with special reference to the war emergency. The regular Agricultural Appropriation Act, aproved Oct. 1, 1918, includes an appropriation of $250,000 to enable the Secretary of Agriculture not only to determine the best means and processes of dehydration (see also XXIII, *Biological Chemistry*) and to disseminate information as to the value and suitability of dried products for food, but to establish and operate plants for drying fruits, vegetables, and other edible products for supplying food for the Army and Navy, if such action is deemed necessary by the President. Coöperation with commercial drying concerns is also provided. The Secretary of Agriculture has designated an advisory board to administer this appropriation, consisting of representatives of the Department of Agriculture, the Food Adminstration, and the Sanitary Corps of the Army.

Pits and Shells for Gas Masks.—The war brought into valuable use a hitherto neglected by-product of fruits and nuts. The pits and shells have proved to be especially adapted for producing carbon used in making gas masks. Two hundred peach pits or seven pounds of shells furnish enough material for one mask. Acting on the request of the War Department, the boys' and girls' clubs of the country carried on an active campaign for the collection of peach, prune, and plum pits, seeds of dates and olives, and shells and whole nuts of hickory nuts, butternuts, English and native walnuts, and hazelnuts. An enormous quantity of these otherwise waste products was delivered to local Red Cross headquarters, which were acting as central stations for collecting and shipping pits and shells.

A New Asparagus.—A new strain of asparagus that is larger, more uniform, and more productive than the old varieties and in addition is highly disease-resistant has been developed through ten years of work by J. B. Norton, a plant breeder in the Bureau of Plant Industry, who introduced, tested and hybridized asparagus from all parts of the world. Introduction of the new strain is expected eventually to stamp out the "rust," a destructive disease that swept over the country a few years ago.

FORESTRY

E. J. Glasson

Fire Protection. — The forest-fire season of 1918 was disastrous as to loss of both life and property. The spring fires were not so serious in the United States, but during May and June New Brunswick and Nova Scotia suffered the heaviest forest damages for many years past. In the Northwest, early drouth, high winds, electrical storms, labor shortage, and depletion of the regular protective force as a result of the war combined to make the fire conditions unprecedently bad. To meet this emergency the President authorized a loan of $1,000,000 to the Forest Service for fire-fighting expenses from the special defense fund of $50,000,000 placed at his disposal by Congress. On Oct. 12 and 13 forest fires in Carlton County, Minn., swept over 50 sq. miles of land, stripping it of timber, crops, live stock, and human habitation. At least 21 towns were totally or partially destroyed and probably 1,000 lives lost. Some evidence was obtained indicating that the fire was of incendiary origin.

As recent examples of the growing spirit of coöperation between private and public owners may be mentioned the arrangements with 126 individual owners of timber lands in California, controlling about 250,000 acres of timber, whereby the Forest Service assumed the detection and fighting of all fires at an average cost of 1.5 cents per acre, paid by the owners. The four coöperative forest-protective associations in the Province of Quebec now furnish protection to more than 44,000,000 acres of forest land, including about 80 per cent. of the crown timber lands under license.

During the calendar year 1917, forest officers fought 7,814 fires in the National Forests, of which 5,682 were caused by human agencies and could have been prevented. There were 952 incendiary fires which occurred for the most part in Oregon, California and Arkansas. The fires, which burned over 962,000 acres, caused a loss to the Government of $1,358,600 in timber, forage, and young growth. In addition to this loss, they entailed extra expenditures by the Government of $1,121,451. In view of the extreme importance of our forests for the successful conduct of the war and during the reconstruction period to follow, the campaign of education against carelessness and indifference was pressed with renewed energy.

Forest Legislation.—To encourage the wood-distillation industry in Mississippi, the legislature passed a bill exempting from taxation for a period of five years all wood-distillation plants that may be built in that state. The Louisiana legislature empowered the commissioner of conservation to promulgate and enforce regulations requiring the use of spark arresters and proper ash pans on all locomotves and stationary engines within 200 ft. of any wooded or cut-over lands. A law was also passed providing for the sale of timber on the State Game Preserve of some 6,000 acres, the proceeds to be applied to the purchase of new state forests. Under legislation passed at the recent session of the Parliament of New Brunswick, a commission to take full charge of the forests of the crown lands of the province was authorized.

National Forests.—Statistics corrected to Jan. 1, 1918, show a total of 147 national forests in the United States, with a net area, including Alaska and Porto Rico, of 154,658,372 acres. In addition, 20,773,885 acres of other lands are situated within national-forest boundaries. National monuments for the preservation of objects of historic or scientific interest, comprising a total of 1,126,500 acres, have been set aside in 13 of the national forests in the states of Washington, Oregon, California, Arizona, New Mexico, Colorado and South Dakota, and in Alaska. Game preserves to the extent of 1,492,928 acres in Arizona, 53,810 acres in North Carolina, and 57,120 acres in Oklahoma are situated wholly or in part within national forests of those states. The acreage aproved for purchase in the White Mountain and southern Appalachian regions aggregated 1,566,952 acres.

In June President Wilson issued a proclamation establishing three new national forests in the East, the White Mountain in Maine and New Hampshire, the Shenandoah in Virginia and West Virginia, and the Natural Bridge in Virginia. Each forest represents the final step in carrying out the law passed by Congress in 1911 providing for the purchase by the Government of forest lands on the watersheds of navigable streams. Additional lands that have been purchased in the White Mountains and southern Appalachians will be proclaimed national forests as their accumulation reaches a point justifying the step.

During the fiscal year ending June 30, 1918, the national forests' receipts from all sources totaled over $3,574,000, an increase of about $120,000 over 1917. Timber sales yielded over $1,500,000, and live-stock grazing over $1,700,000. Slightly less than $100,000 was received from water-power development permits, and about $120,000 from other special uses. To meet the war needs of the country, 500,000 more sheep and nearly 250,000 more cattle were being grazed during the current fiscal year, thereby bringing the total number of stock grazed under permit to about 9,000,000 sheep, 2,360,000 head of cattle, and 51,000 swine. The cost of operating the national forests was about $4,000,000, exclusive of $700,000 provided by Congress to meet the serious fire situation in 1917.

More than 35,000 plant specimens, representing 4,800 species, have been collected on national forests and purchase areas by Forest Service officers in connection with the extensive studies made of the distribution, natural habits and economic importance of the range flora. The data obtained have direct application to many phases of range management, such as intensive range utilization, especially with a view to minimum interference with the requirements of the important forage plants and the utilization of each type at the time and by the class of stock to which it is best adapted. Use of these data is also made in the detection, eradication and fencing of poisonous plant areas, in natural range reseeding, and other range studies.

Forestry and the War.—The development of a second forestry regiment for service in France was continued in 1918 (*A. Y. B.*, 1917, p. 459). This regiment, the 20th Engineers (Forest), comprised ten battalions of foresters, woodsmen, and lumbermen with an enlisted strength of 7,500, together with nine service battalions composed of laborers with a strength of 7,250 enlisted men. United States Forester Henry S. Graves, who was commissioned as a lieutenant-colonel, has full charge of the division of forestry of the American Expeditionary Force. In the race for airplane spruce and ship timbers in the Pacific Northwest, more miles of railroad were conceived, located, surveyed, cleared, graded, constructed and completed within the lumbering season of 1918 than in any one season before. The construction work was done largely by soldier labor. It was announced in the fall that spruce production had already reached 1,000,000 ft. a day at the Government "cut-up" plant at Vancouver, Wash. (see also XX, *Aeronautics*). Strenuous efforts which gave promise of success were being made to raise this production to 2,000,000 ft. a day.

During the four years' test in the present war black-walnut wood has proved to be the best material for airplane propellers and gunstocks. Owing to their inability to purchase sufficient walnut logs the sawmill proprietors were not able to supply the requirements of this Government and the Allies, and everybody in the United States possessing walnut trees of suitable size and quality were called upon to sell them for war purposes. In some instances wealthy estate owners sacrificed their trees for the good of the cause. Acting on the request of the President, the Boy Scouts have been spotting walnut trees all over the country, and over 5,000 carloads of lumber have been located by them. Valuable aid in locating walnut was also given by the various branches and chapters of the American Red Cross.

FISHERIES

Hugh M. Smith

General Condition and Extent.—The American fisheries in 1918 attained their highest value, owing in part to an advance in prices and in part to increased production. While no general canvas of the industry has been made, the approximate value of products as put on the market may be placed at $135,000,000. Developments occasioned by war have been requisitioning of fishermen and fishing vessels for military purposes; requirement and issuance of fishing licenses by the Food Administration; relaxation of local laws to secure increased production; intimate coöperation of the Federal Government with commercial interests in extending fishery trade and establishing new local markets; continued progress in making the public acquainted with neglected aquatic resources; plans for large increase in fleet of steam trawling vessels; and allotments by the President, from the special fund at his disposal for national security and defense, of sums for promoting the fisheries and increasing the food supply therefrom, including the establishment in Washington of a fishery-products laboratory.

New England Vessel Fisheries.—The vessel fisheries centering at Boston and Gloucester, Mass., and Portland, Me., which comprise most of the offshore fleet of New England, were in a flourishing condition in 1917. The fleet numbered 493 vessels, and brought in 9,284 fares of fish, 3,248 at Portland, 3,074 at Gloucester, and

2,962 at Boston. The landings at Boston were 98,650,140 lb., valued at $5,166,440; at Gloucester 58,134,945 lb., $2,451,484; at Portland, 18,645,505 lb., $743,408; total, 175,430,590 lb., $8,361,332, against 185,824,425 lb., valued at $6,383,906, in 1916. The catch of the principal species was as follows:

	Pounds	Value
Cod	56,446,530	$2,370,834
Haddock	53,554,835	2,516,702
Mackerel	17,442,065	1,454,119
Pollock	14,507,790	579,268
Herring	13,138,565	298,614
Hake	7,914,645	341,385
Cusk	3,549,305	119,114
Swordfish	1,973,520	292,169
Halibut	1,766,065	219,232
Tilefish	1,211,450	44,743
Miscellaneous	3,925,820	125,152

Owing to high prices, these fisheries had a value never before attained, and many individual vessels stocked over $50,000, one reaching $98,000. In the summer of 1918 enemy submarines destroyed about 20 vessels in this fleet.

As bearing on the dependence of United States fishing vessels on grounds lying off the coasts of Canada and Newfoundland, it may be noted that in 1917 over 62 per cent. of the quantity and nearly 68 per cent. of the value of the catch represented fish taken from grounds off the New England coast.

Pacific Salmon Industry. — This is the most important branch of the American fisheries, and in 1917 was more valuable and extensive than ever before. While large quantities of salmon are sold in a fresh, frozen, salted, and smoked condition, the great bulk of the catch is canned. Canneries in 1917 were as follows: 118 in Alaska, 47 on Puget Sound, 17 on Washington coast, 20 on Columbia River, 19 on Oregon coast, six in California; total 237. The pack in cases of 48 one-pound cans was: Alaska, 5,947,286; Puget Sound, 1,921,554; Washington coast, 58,445; Columbia River, 555,218; Oregon coast, 84,099; California, 27,773; total 8,592,375 cases; value, $67,037,038; gross weight of salmon used in canning, 601,416,250 lb. In Alaska and Puget Sound sockeye and humpback salmons predominated, in Columbia River and California, chinooks, and on the Washington and Oregon coast, chinooks and silversides. The pack of each species in cases was: chinook, 592,103; sockeye, 2,912,495; humpback, 3,431,083; chum, 1,202,074; silversides, 430,683; steelhead, 23,937. Salmon prepared otherwise than by canning had a gross weight of 25,400,500 lb. and was valued at $2,117,000.

Alaskan Fisheries. — In 1917 the fisheries of Alaska showed a large increase over the preceding year in value and quantity of products. Total investment was $54,937,549, an increase of $15,367,937 over 1916; number of persons engaged, 29,491, an increase of 5,497; total value of products, $51,466,980, an increase of $25,310,421. The most notable gain was in the salmon-canning industry, which engaged 88 per cent. of capital and yielded 90 per cent. of value of all fishery products. Other important products were: pickled, mild-cured, and fresh salmon, $1,887,958; halibut, $1,120,226; cod, $744,976; herring, $767,729; whale, $654,852; and clam, $274,036; all in excess of the preceding year. Returns for 1918 indicate a salmon pack of 6,000,000 cases, worth $50,000,000. An important feature of 1918 was the inauguration of salmon canning in the Yukon River.

Fisheries of Seattle, Wash.—The vessel fisheries centering at Seattle, Wash., conducted along the entire coast from Columbia River to central Alaska, yield principally halibut and sablefish. In 1917 there were 620 fares landed at Seattle, aggregating 16,553,945 lb., valued at $1,738,800, of which 13,949,685 lb., $1,625,409, was halibut, and 2,430,105 lb., $107,350, sablefish. The grounds which produced the largest catches are Flattery Banks, off Washington; Hecate Strait, off British Columbia; and Portlock Bank and Yakutat grounds, off Alaska. The local boat and shore fisheries in Puget Sound and contiguous waters in 1917 sent to the Seattle market in collecting vessels over 12,820,000 lb. of products, valued at $988,560, the products consisting chiefly of salmon.

Alaskan Fur-Seal Industry. — The seal herd resorting to Pribilof Islands numbered 530,480 animals of all ages in 1918. There were 143,000 newborn pups and the same number of breeding cows. The herd is in excellent condition and shows a healthy annual increase. The only untoward feature is the preponderance of old males resulting from the enforced five-year close time imposed by law. The resumption of regular commercial sealing in 1918 was made possible by the expiration of the close time in August, 1917. By the end of the killing season on Sept. 10, 33,880 surplus male seals had been taken for their skins. These were sent to St. Louis for sale at public auction, for account of the Governments of the United States, Great Britain, and Japan.

Fish Culture.—Important work in fish culture in aid of the fishing industry is done by the Federal Government and various states, especially New York, Rhode Island, Ohio, Maryland, Wisconsin, California, Oregon and Washington. In the fiscal year 1918, the U. S. Bureau of Fisheries operated 76 hatcheries and auxiliaries, and planted fish in every state and Alaska, the output aggregating 4,098,105,000. The most extensive operations were addressed to Pacific salmons; also, whitefish, cisco, trout, and pike perch in the Great Lakes; shad, salmon, yellow perch, and striped bass in Atlantic rivers; black bass, buffalofish in the interior; and cod, pollock, flounder, and lobster on the northeast seaboard.

International Fishery Questions.—An important international commission, officially known as the American-Canadian Fisheries Conference, met during 1918 to consider outstanding fishery questions between the United States and Canada, some of recent origin, others antedating the American Revolution. The principal matters coming before the Conference were the rehabilitation of the salmon fisheries of the Fraser River system, protection of the Pacific halibut, protection of the sturgeons, reciprocal port privileges to fishing vessels, requirements imposed on Canadian fishing vessels in territorial waters of Alaska, lobster fishing by American vessels off the Canadian coast, protection of fish in Lake Champlain, and protection of whales. Following public hearings on the Atlantic and Pacific coasts of both countries, there was submitted a final report embodying findings and recommendations for the consideration of both Governments. In the course of the inquiries, the Canadian Government took steps to accord to fish in Canadian waters of Lake Champlain the same protection that is given in New York and Vermont; the American Government removed restrictions that had for years been placed on Canadian fishing vessels passing through the territorial waters of Alaska; each Government, as a war measure, issued orders extending to the fishing vessels of the other full reciprocal port privileges.

STATISTICS OF AGRICULTURE

WORLD'S PRODUCTION OF PRINCIPAL CROPS, 1904-1915

(*Yearbook of the Department of Agriculture*)

	1904	1909	1914	1915
Barley (bu.)	1,175,784,000	1,458,263,000	1,463,289,000	1,522,732,000
Corn (bu.)	3,109,252,000	3,563,226,000	3,877,913,000	4,201,589,000
Cotton (bales)	21,005,175	20,679,334	....	....
Flaxseed (bu.)	107,743,000	100,820,000	....	....
Hops (lb.)	178,802,000	128,173,000	[1]234,826,000	....
Oats (bu.)	3,611,302,000	4,312,882,000	4,034,857,000	4,362,713,000
Potatoes (bu.)	4,298,049,000	5,595,567,000	....	....
Rice (lb.)	115,735,800,000	127,700,000,000	....	....
Rye (bu.)	1,742,112,000	1,747,123,000	1,596,882,000	1,577,490,000
Sugar (short tons)	13,744,000	16,004,000	20,704,000	20,385,000
Tobacco (lb.)	2,146,641,000	2,742,500,000	....	....
Wheat (bu.)	3,163,542,000	3,581,519,000	3,585,916,000	4,127,685,000

[1] Preliminary.

XVI. AGRICULTURE, HORTICULTURE, FORESTRY AND FISHERIES

WORLD'S PRODUCTION OF PRINCIPAL CROPS, BY COUNTRIES, 1904-1917

(Yearbook of the Department of Agriculture)

	1904 Production (000 omitted)	1909 Production (000 omitted)	1914 (000 omitted)		1916 (000 omitted)		1917 (000 omitted)	
			Acres	Production	Acres	Production	Acres	Production
BARLEY (bu.):								
Algeria	37,106	31,511	3,131	35,785	3,009	39,866	2,839	31,461
Austria-Hungary	119,451	153,582	......	128,663	......	......	......	......
Canada	43,872	55,398	1,496	36,201	1,803	42,770	......	......
France	38,827	46,144	1,780	42,719	1,538	38,268	1,789	39,557
Germany	135,409	160,551	3,909	144,125	[2]	[2]	......	......
Japan	80,000	87,219	3,294	85,775	3,079	89,486	2,738	76,505
Russia (European)	343,981	464,734	29,755	383,572	......	......	......	......
Spain	60,000	81,579	3,404	72,272	3,886	86,863	4,086	76,747
United Kingdom	64,474	71,116	1,870	66,637	1,652	54,568	......	......
United States	139,749	173,321	7,565	194,953	7,757	182,309	8,835	208,975
CORN (bu.):								
Argentina	175,189	177,155	10,260	263,135	9,928	161,133	8,969	58,839
Austria-Hungary	89,757	210,241	[2]	215,079	......	......	......	......
Bulgaria	12,758	20,472	1,571	30,901	[2]	[2]	......	......
Canada	20,242	19,263	256	13,924	173	6,282	......	......
Egypt	30,000	65,000	1,763	78,253	1,850	68,362	1,735	......
France	19,482	26,075	1,128	22,530	812	[2]	738	[2]
Italy	90,546	99,289	3,680	104,966	3,918	81,547	3,627	87,000
Mexico	83,131	170,000	4,748	78,443	[2]	[2]	......	......
Roumania	19,598	70,138	5,104	102,552	5,056	[2]	......	......
Russia	25,920	39,598	4,020	80,911	......	......	......	......
Serbia	9,498	34,453	[2]	20,000	[2]	[2]	[2]	[2]
South Africa	8,784	20,000	[2]	[3]30,830	2,740	25,000	2,608	34,999
Spain	21,255	26,433	1,137	30,325	1,154	28,642	1,102	27,557
United States	2,467,481	2,552,190	103,435	2,672,804	105,296	2,566,927	119,755	3,159,494
COTTON (bales):								
Brazil	220	265	[2]	385	[2]	420	......	......
French Indo-China	1,200	1,200	[2]	[2]	[2]	[2]	......	......
Egypt	1,305	1,045	1,822	1,425	1,719	1,248	......	......
India	3,727	4,123	25,023	4,239	21,212	3,576	......	......
Mexico	253	200	......	......	......	......	......	......
Persia[4]	71	128	......	......	......	......	......	......
Peru	45	44	[2]	[4]110	[4]137	[4]113	......	......
Russia (Asiatic)	504	418	1,807	1,309	2,131	......	......	......
Turkey (Asiatic)	66	131	......	......	......	......	......	......
United States[7]	13,439	10,005	36,832	16,135	34,985	11,450	33,634	10,949
HOPS (lb.):								
Australasia	......	2,206	......	1,667	......	......	......	......
Austria-Hungary	......	20,577	[1]	[1]	......	......	......	......
Belgium	......	3,861	6	7,560	[2]	[2]	......	......
France	......	5,029	7	7,034	5	4,957	......	......
Germany	......	13,356	68	51,227	[2]	[2]	......	......
Russia	......	8,267	[2]	14,084	[2]	[2]	......	......
United Kingdom	......	24,022	37	56,813	31	34,479	......	......
United States	......	50,697	[2]	43,415	44	50,595	30	27,788
OATS (bu.):								
Argentina	......	31,984	3,087	50,981	2,565	75,280	2,525	31,781
Austria-Hungary	177,523	251,277	......	225,651	......	......	......	......
Canada	202,827	353,466	10,061	313,078	10,996	410,211	......	......
Denmark	40,000	42,170	[1]1,059	38,653	1,042	42,286	981	37,685
France	261,264	331,183	8,873	274,458	7,777	277,179	7,706	237,426
Germany	477,852	628,712	10,843	622,674	[2]	[2]	[2]	[2]
Russia	1,081,034	1,145,387	[6]40,294	[6]722,488	34,706	843,249		
Sweden	50,117	69,292	1,960	52,557	1,954	93,089	1,929	70,754
United Kingdom	191,565	184,370	3,879	180,241	4,147	176,049	....	......
United States	894,596	1,007,129	38,442	1,141,060	41,527	1,251,831	43,572	1,587,286
POTATOES (bu.):								
Austria-Hungary	639,407	682,927	......	......	......	......	......	......
Belgium	82,846	90,358	411	[2]	[2]	[2]	......	......
Canada	74,746	99,085	476	85,672	473	63,297	......	......
France	375,000	613,041	3,676	440,652	3,222	335,507	......	......
Germany	1,702,803	1,716,143	8,367	1,675,370	[2]	882,000	......	......
Italy	29,000	63,273	727	61,104	729	54,277	......	......
Netherlands	96,695	97,275	424	120,780	413	88,490	......	......
Russia	1,082,723	1,204,528	[6]8,856	[6]909,486	......	......	......	......
Spain	84,000	98,860	688	76,657	[2]	[2]	......	......
Sweden	78,020	61,981	376	48,817	373	54,972	......	......
United Kingdom	265,713	256,752	1,197	279,121	1,144	204,172	......	......
United States	278,985	389,195	3,711	409,921	3,565	286,953	4,390	442,536

[1] Area refers to 1910. [2] No official statistics. [3] Census figures of 1911. [4] Exports.
[5] Area and production, 1912. [6] Omitting Poland. [7] Linters not included.

WORLD'S PRODUCTION OF PRINCIPAL CROPS, BY COUNTRIES—*Continued*

	1904 Production (000 omitted)	1909 Production (000 omitted)	1914 (000 omitted)		1916 (000 omitted)		1917 (000 omitted)	
			Acres	Production	Acres	Production	Acres	Production
RICE (lb.):								
Egypt	141,000	653,458	37	81,229	150	236,528	......	......
Formosa	2,598,100	1,446,000	1,235	1,447,709	[4]	[4]	......	......
FrenchIndo-China	5,000,000	5,000,000	......	......	......	......	......	......
India	72,325,000	86,712,000	76,625	61,022,080	79,700	76,336,960	......	......
Italy	760,500	647,000	361	741,263	353	708,058	......	......
Japan	18,658,700	16,375,000	7,434	17,908,918	9,543	18,315,713	......	......
Java and Madura	6,431,000	7,566,000	6,346	7,826,026	[4]	[4]	......	......
Korea	3,200,000	3,200,000	[4]	3,678,878	[4]	[4]	......	......
Madagascar[2]	......	953,000	......	......	1,176	1,017,470	......	......
Philippine Islands	544,000	1,018,000	3,076	1,403,516	2,819	1,234,332	......	......
Siam	6,824,000	6,824,000	5,096	5,711,133	......	......	......	......
Spain	394,600	282,065	97	336,925	100	328,931	......	......
United States	619,400	702,709	694	656,917	869	1,135,028	864	36,278
RYE (bu.):								
Austria-Hungary	138,009	164,898	......	119,547	......	......	......	......
Belgium	22,000	23,154	645	23,137	[4]	[4]	......	......
Bulgaria	13,000	6,906	527	7,255	[4]	8,490	......	......
Canada	2,995	1,715	111	2,017	148	2,876	......	......
Denmark	18,000	18,922	[4]	10,905	481	10,596	436	8,858
Finland	......	12,085	[4]	10,806	[4]	[4]	[4]	[4]
France	53,343	54,934	2,614	32,002	2,149	33,351	2,002	27,509
Germany	396,075	446,763	15,565	410,478	[4]	[4]	[4]	[4]
Netherlands	14,000	17,652	563	13,471	499	12,391	463	11,958
Russia	1,008,381	896,833	66,082	820,078	......	......	......	......
Spain	19,000	34,901	1,887	23,950	1,846	28,782	1,800	24,365
Sweden	20,960	25,728	981	27,599	913	22,929	813	15,747
United States	27,242	29,520	2,541	42,779	3,213	48,862	4,102	60,145
SUGAR CANE (short tons):								
Australia	127	185	......	297	......	180	......	336
Brazil	221	273	......	[4]228	......	......	......	......
Cuba	1,165	1,701	......	2,891	......	2,967	......	2,865
India	19	1,097	......	2,566	......	2,950	......	2,941
Java	991	1,369	......	1,503	......	1,412	......	1,760
Mauritius	241	215	......	275	......	236	......	313
United States	754	1,226	......	301	......	[6]139	......	312
BEET (short tons):								
Austria-Hungary	......	1,529	......	1,854	......	1,213	......	805
Belgium	227	272	......	251	......	125	......	......
France	900	785	......	791	......	150	......	205
Germany	2,158	2,292	......	2,994	......	1,896	......	......
Netherlands	......	217	......	231	......	263	......	287
Russia	1,351	1,242	......	1,681	......	1,699	......	1,600
United States	233	426	......	733	......	874	......	821
TOBACCO (lb.):								
Austria-Hungary	111,815	190,274	......	......	......	[4]	......	......
Brazil	52,832	64,654	[4]	59,481	[4]	[5]46,943	......	......
Cuba	42,421	59,323	[4]	80,770	[4]	42,043	......	......
Dutch East Indies	90,125	134,100	[4]	[5]155,612	[4]	[4]	......	......
Germany	75,797	62,120	26	50,192	32	[4]	......	......
India	450,000	450,000	7,038	1,038	[4]	[4]	......	......
Japan	106,075	91,850	89	126,206	72	104,167	......	......
Philippine Islands	33,100	40,258	150	103,024	146	90,695	......	......
Russia	204,298	207,451	[7]127	[7]181,723	[4]	[4]	......	......
Santo Domingo	......	30,000	......	[5]8,169	[4]	17,250	......	......
Turkey (Europe)	......	49,177	......	......	......	......	......	......
United States[6]	665,461	1,065,765	1,224	1,034,679	1,413	1,153,278	1,447	1,196,451
WHEAT (bu.):								
Argentina	120,598	156,162	16,243	113,904	16,420	172,620	16,089	70,224
Austria-Hungary	203,998	186,085	......	[3]153,477	......	......	......	......
Australasia	84,627	73,612	9,453	112,159	12,814	192,041	11,448	155,855
Canada	76,427	166,744	10,293	161,280	10,058	220,367	......	......
France	296,606	356,193	14,975	282,689	15,370	262,781	14,756	......
Germany	139,803	137,999	4,932	145,944	[4]	[4]	[4]	[4]
India	357,162	285,189	28,475	312,032	30,320	323,008	32,940	379,232
Italy	150,400	190,378	11,783	169,581	11,679	176,530	10,556	139,999
Roumania	53,738	56,751	5,218	49,270	4,844	78,520	......	......
Russia	706,706	783,270	[7]61,583	[7]573,384	42,030	440,082	......	......
Spain	110,000	144,105	9,681	116,089	10,148	10,360	153,329	141,087
United Kingdom	39,083	65,188	1,905	64,356	2,051	59,908	......	......
United States	552,400	683,530	53,541	891,017	52,316	636,318	45,941	650,828

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[1] Year preceding. [2] Data for 1908. [3] Not including Galicia and Bukowina. [4] No official statistics. [5] Exports. [6] Continental U. S. only. [7] Not including Poland.

PRODUCTION OF PRINCIPAL CROPS IN THE UNITED STATES, 1904-1918

(*Yearbook of the Department of Agriculture*)

(000 omitted)

	1904 (census)	1909 (census)	1914	1916	1917	1918[1]
TOTAL:						
Barley (bus.)	139,749	173,344	494,953	182,309	211,759	256,375
Buckwheat (bus.)	15,008	14,849	16,881	11,662	16,022	17,182
Corn (bus.)	2,467,481	2,552,190	2,672,804	2,566,927	3,065,233	2,582,814
Cotton (500-lb. bales)[2]	13,438	10,005	16,135	11,450	11,302	11,700
Flaxseed (bus.)	23,401	19,513	13,749	14,296	9,164	14,657
Hay (tons)	60,696	68,833	70,071	91,192	83,308	75,459
Hops (lb.)	49,359	50,697	43,415	50,595	29,388	20,193
Oats (bus.)	894,596	1,007,129	1,141,060	1,251,837	1,592,740	1,538,359
Potatoes (bus.)	332,830	389,195	409,921	286,953	438,618	397,676
Rice (bus.)	21,096	21,839	23,649	40,861	34,739	28,851
Rye (bus.)	27,242	29,520	42,779	48,862	62,933	89,103
Tobacco (lb.)	660,461	1,055,765	1,034,679	1,153,278	1,249,608	1,340,019
Wheat (bus.)	552,400	683,366	891,017	636,318	636,655	917,100
AVERAGE PER ACRE:						
Barley (bus.)	27.2	22.5	25.8	23.5	23.7	26.5
Buckwheat (bus.)	18.9	16.9	21.3	14.1	17.4	16.5
Corn (bus.)	26.8	25.9	25.8	24.4	26.3	24.0
Cotton (lb.)	204.9	154.3	209.2	156.6	159.7	155.9
Flaxseed (bus.)	10.3	9.4	8.4	9.7	4.6	7.6
Hay (tons)	1.52	1.35	14.3	1.64	1.51	1.35
Oats (bus.)	32.1	28.6	29.7	30.1	36.6	34.6
Potatoes (bus.)	110.4	106.1	110.5	80.5	100.3	94.7
Rice (bus.)	31.9	35.8	34.1	47.0	35.4	36.3
Rye (bus.)	15.2	13.4	16.8	15.2	14.6	14.4
Tobacco (lb.)	819.0	815.3	845.7	816.0	823.2	865.1
Wheat (bus.)	12.5	15.4	16.6	12.2	14.1	15.5

[1] Final estimate issued December 1.

[2] Excluding linters.

PRODUCTION OF PRINCIPAL CROPS IN THE UNITED STATES, BY STATES, 1904–1918

(*Yearbook of the Department of Agriculture*)

	1904		1909		1914		1917		1918	
	Average per Acre	Total (000 omitted)	Average per Acre	Total (000 omitted)	Average per Acre	Total (000 omitted)	Average per Acre	Total (000, omitted)	Average per Acre	Total (000 omitted)
BARLEY (bus.):										
California	22.7	28,091	26.5	31,270	30.0	42,060	29.0	39,150	......	....
Idaho	37.4	1,707	40.0	2,480	38.0	7,030	29.0	5,075	26.0	34,320
Iowa	27.8	13,552	22.0	10,890	26.0	9,360	35.0	10,500	28.0	4,900
Minnesota	28.4	32,123	23.6	31,600	23.0	31,694	27.0	34,425	31.5	11,340
N. Dakota	28.1	17,518	21.0	20,727	19.5	28,275	12.5	22,812	21.5	37,281
S. Dakota	28.0	9,787	19.5	19,910	23.0	19,550	27.0	31,182	29.5	41,300
Washington	34.8	5,824	39.5	7,189	39.0	7,098	29.0	4,930	15.2	2,630
Wisconsin	30.0	14,941	28.0	24,248	27.3	18,428	32.0	19,200	35.7	25,383
CORN (bus.):										
Alabama	15.0	41,877	13.5	30,696	17.0	55,488	16.0	77,200	14.6	67,686
Georgia	11.9	47,234	13.9	39,375	14.0	56,000	16.0	72,000	15.0	68,850
Illinois	36.5	341,133	36.9	390,219	29.0	300,034	38.0	418,000	35.5	351,450
Indiana	31.5	143,396	40.0	195,496	33.0	163,317	36.0	196,776	33.0	169,554
Iowa	32.6	303,039	31.5	341,750	38.0	389,424	37.0	410,700	36.0	375,624
Kansas	20.9	134,609	19.9	154,652	18.5	108,225	13.0	119,028	7.1	43,523
Kentucky	26.9	86,815	29.0	83,348	25.0	91,250	31.5	114,975	26.0	93,600
Michigan	28.6	36,990	35.4	52,907	36.0	63,000	21.5	37,625	30.0	48,300
Minnesota	26.9	41,809	34.8	67,897	35.0	91,000	30.0	91,800	40.0	110,000
Mississippi	19.1	39,709	14.5	28,429	18.5	58,275	20.5	77,613	17.0	66,300
Missouri	26.2	151,522	26.4	191,427	22.0	158,400	35.5	241,500	29.0	133,860
Nebraska	32.8	260,942	24.8	180,133	24.5	173,950	27.0	249,480	17.7	123,086
Ohio	32.5	99,628	39.5	157,513	39.1	142,715	38.0	150,100	36.0	133,200
Pennsylvania	34.0	48,535	32.0	41,494	42.5	62,178	39.0	61,425	40.0	62,400
S. Dakota	28.1	43,855	31.7	55,559	26.0	78,000	29.0	93,800	34.0	108,188
Tennessee	25.0	80,890	22.0	67,682	24.0	80,400	29.0	104,400	24.0	84,000
Texas	22.6	136,702	15.0	75,499	19.5	124,800	11.0	75,900	10.0	69,000
Wisconsin	29.7	45,119	33.0	49,163	40.5	69,862	22.0	42,196	40.5	69,538

PRODUCTION OF PRINCIPAL CROPS IN THE UNITED STATES, BY STATES, 1904–1918—*Continued*

	1904		1909		1914		1917		1918	
	Average per Acre	Total (000 omitted)	Average per Acre	Total (000 omitted)	Average per Acre	Total (000 omitted)	Average per Acre	Total (000 omitted)	Average per Acre	Total (000 omitted)
COTTON (bales):										
Alabama....	182.0	1,448	142.0	1,024	209	1,751	125.0	518	160.0	820
Georgia.....	205.0	1,888	184.0	1,804	239	2,718	173.0	1,884	188.0	2,100
Mississippi..	220.0	1,798	157.0	1,083	195	1,246	155.0	905	185.0	1,210
N. Carolina.	233.0	704	210.0	601	290	931	194.0	618	265.0	870
Oklahoma...	248.0	804	147.0	545	212	1,262	165.0	959	85.0	550
S. Carolina..	215.0	1,151	210.0	1,100	255	1,534	208.0	1,237	235.0	1,500
Texas......	183.0	3,146	125.0	2,523	184	4,592	135.0	3,115	110.0	2,580
HAY (tons):										
Iowa.......	1.62	5,074	1.64	5,983	1.38	4,071	1.23	4,096	......	4,286
Michigan...	1.25	2,658	1.30	3,403	1.28	3,011	1.50	3,837	......	2,676
New York..	1.36	6,480	1.05	5,002	1.20	5,584	1.46	6,325	......	5,375
Ohio.......	1.43	3,880	1.43	4,033	1.13	3,178	1.42	4,154	......	4,095
Pennsylvania	1.45	4,499	1.20	3,742	1.28	4,020	1.41	4,360	......	4,272
Wisconsin...	1.67	2,959	1.53	3,625	1.75	4,462	1.70	4,622	......	3,537
OATS (bus.):..										
Illinois.....	32.0	117,341	36.6	150,386	29.3	125,990	52.0	239,200	44.0	198,352
Iowa.......	32.0	122,323	27.0	128,198	33.0	165,000	47.0	254,364	42.0	229,572
Ohio.......	40.9	49,733	32.5	57,591	30.5	50,325	44.0	78,100	44.0	79,200
Minnesota..	39.2	85,178	33.0	93,898	28.0	85,120	37.0	120,250	41.0	134,562
N. Dakota..	37.4	31,010	32.0	65,887	28.0	64,904	15.0	38,625	23.5	60,512
Wisconsin...	35.0	86,734	35.0	71,336	27.0	62,100	44.0	99,000	46.6	110,162
POTATOES (bus.):										
Iowa.......	136.0	22,354	89.0	12,905	86.0	12,642	95.0	13,110	72.0	9,648
Maine......	215.0	19,657	225.0	29,250	260.0	33,800	125.0	18,750	200.0	22,400
Michigan...	121.0	31,806	105.0	36,540	121.0	44,044	95.0	35,910	84.0	28,560
Minnesota..	102.0	13,995	115.0	18,400	114.0	30,780	112.0	33,600	105.0	32,760
New York..	93.0	41,129	120.0	52,560	145.0	53,215	95.0	38,000	92.0	34.960
Ohio.......	98.0	16,029	93.0	16,926	95.0	14,250	100.0	16,000	69.0	11,040
Pennsylvania	106.0	27,174	78.0	23,790	105.0	28,140	92.0	29,532	80.0	24,400
Wisconsin...	126.0	31,499	102.0	26,724	124.0	37,696	114.0	34,998	112.0	33,040
RICE (bus.):										
Arkansas...	......	....	40.0	1,120	39.8	3,685	41.0	6,232	43.0	7,310
Louisiana...	30.4	11,445	33.8	12,675	32.1	10,802	31.0	15,500	31.0	17,980
Texas......	35.5	8,314	34.0	9,894	33.8	8,102	30.0	7,140	32.0	7,840
RYE (bus.):										
Indiana.....	14.6	478	16.5	940	16.3	1,614	15.0	4,110	16.5	6,765
Michigan...	13.2	1,752	15.5	5,425	16.0	5,936	14.0	4,774	14.3	6,750
Minnesota..	17.7	1,648	19.0	2,280	18.8	5,245	18.5	6,716	20.0	8,700
New Jersey.	17.5	1,224	16.3	1,288	18.5	1,295	18.5	1,276	18.5	1,350
New York...	14.8	2,177	17.0	2,720	17.7	2,283	19.0	2,375	16.5	1,848
Pennsylvania	15.5	5,367	15.3	5,508	18.0	5,040	17.0	4,165	17.0	4,250
Wisconsn...	16.2	4,905	16.3	4,727	16.5	6,798	18.5	7,585	17.6	7,674
TOBACCO (lb.):										
Connecticut.	1,685	21,407	1,650	22,110	1,770	35,754	1,400	33,600	1,500	37,500
Indiana.....	691	4,314	950	19,000	900	12,150	950	14,725	930	15,159
Kentucky...	827	229,417	835	350,700	910	364,000	900	441,000	900	427,500
Maryland...	621	19,913	710	17,750	800	17,600	790	22,594	830	23,738
N. Carolina.	685	98,618	600	144,000	650	172,250	630	239,400	705	282,000
Ohio.......	849	50,793	925	83,250	900	78,120	960	99,072	980	113,288
Pennsylvania	1,289	18,635	985	30,732	1,450	47,995	1,400	58,100	1,420	64,752
S. Carolina..	703	8,185	800	32,000	730	36,500	710	51,120	720	62,208
Tennessee...	730	34,823	730	53,290	820	63,468	810	81,810	800	62,240
Virginia....	725	96,487	775	120,125	650	113,750	700	129,500	770	146,300
W. Virginia.	710	2,901	875	12,600	820	8,856	800	9,040	720	9,792
Wisconsin...	1,282	52,473	1,180	37,170	1,180	53,808	1,000	44,500	1,330	65,170
WHEAT (bus.):										
Illinois.....	13.8	21,542	17.4	37,831	18.5	46,250	18.5	29,600	21.5	54,266
Indiana.....	9.2	12,525	15.3	33,936	17.4	43,239	18.5	33,392	21.0	49,266
Kansas.....	12.4	65,019	14.4	77,564	20.5	117,200	12.2	45,299	14.1	101,760
Michigan...	9.8	6,873	18.8	16,026	19.7	17,316	18.0	15,210	14.0	10,010
Minnesota..	12.8	68,344	16.8	57,094	10.6	42,975	18.0	1,386	20.0	1,380
Missouri....	17.7	27,163	14.7	29,837	17.0	43,333	15.3	28,917	17.2	52,873
Nebraska...	13.6	31,453	18.8	47,686	18.6	68,116	12.0	7,164	11.1	33,478
N. Dakota..	11.8	53,892	13.7	116,782	11.2	81,592	8.0	56,000	13.0	101,010
Ohio.......	11.5	17,563	15.9	30,664	18.5	36,538	22.0	41,140	19.0	43,225
Pennsylvania	14.1	21,857	17.0	21,564	18.1	23,747	17.5	24,482	17.0	24,718
Washington.	22.2	32,140	23.2	40,920	23.5	41,840	21.5	10,858	23.5	9,424

IMPORTS AND EXPORTS OF IMPORTANT AGRICULTURAL PRODUCTS, 1904-1918

(*Yearbook of the Department of Agriculture*)

(000 omitted)

	1904	1909	1914	1916	1917	1918
IMPORTS						
Total, excluding Forest Products.	$461,434	$638,612	$924,247	$1,186,642	$1,320,802	$1,614,220
Animal matter:						
Cattle	310	1,999	18,697	15,188	13,021	17,852
Horses	1,460	2,007	2,605	1,618	1,888	1,187
Sheep	815	502	532	918	857	1,980
Other animals including fowls	543	528	2,878	926	476	454
Butter	34	141	1,753	212	193	619
Cheese	3,284	5,866	11,011	7,058	4,466	4,089
Cream	....	....	1,550	1,043	666	675
Milk	32	23	1,089	1,515	1,746	2,997
Eggs	61	36	1,060	111	268	484
Silk	46,100	79,903	100,930	124,334	160,572	188,455
Wool	24,813	45,171	53,191	142,421	131,137	198,546
Packing-house products:						
Hides and skins	52,006	78,487	120,290	158,861	216,364	131,629
Meat	935	796	20,402	11,063	2,450	4,293
Vegetable matter:						
Cocoa	9,174	15,222	20,798	35,144	39,834	41,277
Chocolate	426	339	706	660	553	949
Coffee	69,551	79,112	110,725	115,486	133,184	103,059
Vegetable fibers:						
Cotton	8,541	13,622	19,457	40,150	40,430	36,020
Flax	2,541	2,542	2,870	3,508	4,236	5,818
Hemp	869	799	1,564	1,642	2,487	2,748
Jute	4,104	7,216	11,174	7,915	9,855	7,214
Manila	11,423	7,156	9,780	14,067	17,274	30,435
Sisal grass	15,935	10,215	25,861	25,803	25,932	51,533
Fruits	18,964	22,446	33,638	23,286	25,316	24,409
Corn	10	189	7,917	2,865	1,489	3,483
Oats	57	2,651	7,886	303	473	1,963
Wheat	7	36	1,762	5,789	41,900	56,873
Wheat flour	164	446	364	1,689	553	452
Hay	914	60	1,634	679	628	4,619
Hops	1,374	1,337	2,791	145	59	72
Distilled spirits	4,957	7,676	7,264	7,232	7,793	4,331
Malt liquors	2,313	3,215	2,967	1,457	1,400	709
Wines	9,391	12,276	10,117	7,997	8,486	6,615
Nursery stock	1,496	1,946	3,597	3,686	3,956	....
Nuts	5,471	8,664	19,783	21,160	32,865	53,847
Oils, vegetable	11,179	18,238	32,321	33,919	67,677	117,928
Rice, rice meal, etc	3,073	4,698	7,474	6,094	5,774	16,312
Sago, tapioca, etc	695	1,396	1,642	2,227	3,713	5,531
Seeds	3,587	5,958	20,084	33,572	35,880	50,842
Spices	4,366	5,348	5,596	8,947	7,744	11,519
Sugar	71,915	96,554	101,649	208,769	230,946	237,015
Tea	18,229	18,562	16,735	20,600	19,265	30,889
Tobacco	16,939	25,405	35,039	24,619	25,482	45,317
Vegetables	7,008	12,999	15,134	10,811	29,151	30,176
EXPORTS						
Total, excluding Forest Products.	859,160	903,238	1,113,974	1,509,818	467,858	2,281,339
Animal matter:						
Cattle	42,256	18,046	647	2,378	950	1,248
Horses	3,189	3,386	3,389	73,531	59,525	14,924
Mules	412	472	691	22,960	27,801	4,885
Sheep	1,954	365	535	232	368	97
Swine	53	144	134	239	348	257
Other live animals[1]	111	114	408	331	392	328
Butter	1,768	1,268	877	3,590	8,749	6,853
Cheese	2,452	857	414	7,430	15,240	10,785
Milk, condensed	1,367	1,375	1,341	12,713	25,137	68,040
Eggs	396	1,199	3,734	6,134	7,569	7,167
Packing-house products:						
Beef, canned	5,882	1,645	462	9,439	16,946	30,052
Beef, cured	3,281	3,472	2,290	4,034	6,728	7,702
Beef, fresh	26,841	12,698	789	28,886	26,277	370,058
Hides and skins	3,246	1,271	2,807	3,875	2,971	4,089
Lard	46,347	52,712	57,773	47,634	77,009	98,214
Lard, compounds	3,581	6,115	5,489	5,147	8,270	6,612
Pork, cured and pickled	56,268	54,046	54,543	126,171	173,737	337,129
Pork, fresh	1,669	938	359	7,523	8,875	5,226

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[1] Including fowls.

IMPORTS AND EXPORTS OF IMPORTANT AGRICULTURAL PRODUCTS—*Continued*

(*Yearbook of the Department of Agriculture*)

(000 omitted)

	1904	1909	1914	1916	1917	1918
EXPORTS—*Continued*						
Vegetable matter:						
Cotton	$372,049	$417,390	$610,475	$374,186	$543,075	$665,025
Fruits	20,348	16,079	31,031	36,073	37,398	32,217
Barley	6,292	4,672	4,253	20,664	19,027	41,940
Buckwheat	....	....	1	481	351	10
Corn	30,071	25,194	7,008	30,780	72,497	75,306
Oats	475	804	758	47,986	55,035	86,125
Rye	440	1,049	1,555	15,374	21,695	24,158
Wheat	35,850	68,094	87,953	215,533	298,180	80,803
Cornmeal	1,691	1,549	1,186	1,601	2,757	20,359
Oatmeal	463	516	569	1,886	4,491	17,567
Wheat flour	68,894	51,157	54,454	87,338	93,198	244,861
Total grain and grain products	76,215	160,162	165,302	435,679	588,983	633,309
Hops	2,116	1,271	6,954	4,387	774	994
Distilled spirits	1,691	1,883	2,276	11,062	18,508	5,719
Malt liquors	854	1,010	1,485	1,065	1,442	1,731
Oil cake	17,069	25,836	21,668	28,561	31,222	4,994
Vegetable oils	12,618	23,098	16,251	27,165	26,280	25,021
Seeds	2,583	5,256	3,191	3,539	4,002	5,659
Sugar	532	2,785	1,840	79,390	77,094	38,757
Tobacco	29,640	30,902	53,964	53,364	59,788	69,675
Vegetables	2,603	3,760	6,936	15,952	22,291	26,973

AVERAGE PRICES OF AGRICULTURAL PRODUCTS, 1904–1918

(*Yearbook of the Department of Agriculture*)

	1904	1909	1914	1916	1917	1918
FARM CROPS:[1]						
Barley (bus.)	$0.42	$0.54	$0.543	$0.881	$1.137	$0.918
Beans (bus.)[2]	1.72½–2.20	2.25–2.75	2.10–3.10	5.100	6.59	5.28
Buckwheat (bus.)	0.622	0.701	0.764	1.127	1.600	1.664
Corn (bus.)	0.441	0.579	0.644	0.889	1.279	1.366
Cotton (lb.)	0.0873	0.139	0.068	0.196	0.277	0.276
Flaxseed (bus.)	0.993	1.529	1.256	2.480	2.966	3.402
Hay (tons)	8.72	10.50	11.12	11.220	17.09	20.18
Hops (lb.)[3]	0.32–0.41	0.12–0.39	0.23–0.50	0.120	0.333	0.196
Oats (bus.)	0.313	0.402	0.438	0.524	0.666	0.710
Potatoes (bus.)	0.453	0.541	0.487	1.461	1.230	1.196
Rice (bus.)	0.658	0.796	0.924	0.906	1.896	1.917
Rye (bus.)	0.688	0.718	0.865	1.221	1.660	1.515
Tobacco (lb.)	0.081	0.101	0.098	0.147	0.241	0.279
Wheat (bus.)	0.924	0.986	0.986	1.603	2.008	2.044
LIVE STOCK:[4]						
Cattle:						
Beef[5]	1.70–7.65	2.90–9.50	4.85–11.25	6.56	8.21	9.14
Milch cows	29.21	32.36	53.94	63.18	75.00	84.51
Horses	67.93	95.64	109.32	129.00	129.26	122.16
Mules	78.88	107.84	123.85	....	....	....
Sheep	2.59	3.43	4.04	6.77	10.20	10.11
Swine	6.15	6.55	10.40	8.76	....	15.92
LIVE STOCK PRODUCTS:						
Butter (lb.)[6]	0.17½–0.28	0.25–0.37	0.24½–0.50	34.4	41.9	52.7
Eggs (doz.)[7]	0.16–0.47	0.19–0.55	0.20–0.62	38.1	43.3	55.0

[1] Average farm prices Dec. 1. [2] Wholesale prices at Boston. [3] Wholesale prices at New York. [4] Prices Nov. 15. [5] Wholesale prices of inferior to prime beef per 100 lb. at Chicago, for the year. [6] Wholesale prices of extra creamery butter at New York. [7] Wholesale prices of average best fresh eggs at New York.

LIVE STOCK IN THE UNITED STATES, 1905–1918

(*Yearbook of the Department of Agriculture*)

(000 omitted)

	Number Jan. 1, 1905	Number Jan. 1, 1910	Number Jan. 1, 1915	Number Jan. 1, 1917	Number Jan. 1, 1918
MILCH COWS:					
Total, U.S.	17,572	21,801	21,262	22,894	23,284
Illinois	995	1,232	1,007	1,057	1,057
Iowa	1,335	1,570	1,377	1,405	1,405
Michigan	556	936	814	865	874
Minnesota	836	1,125	1,186	1,302	1,328
Missouri	569	925	797	875	910
New York	1,721	1,771	1,509	1,539	1,524
Ohio	790	947	895	950	940
Pennsylvania	1,086	1,140	943	980	960
Texas	838	1,137	1,086	1,175	1,128
Wisconsin	1,095	1,506	1,626	1,750	1,785
OTHER CATTLE:					
Total, U.S.	43,669	47,279	37,067	41,689	43,546
California	1,122	1,120	1,480	1,636	1,701
Illinois	1,666	1,974	1,180	1,251	1,314
Iowa	3,467	3,611	2,683	2,754	2,919
Kansas	2,682	3,260	1,768	2,200	2,354
Minnesota	941	1,228	1,208	1,400	1,540
Missouri	1,490	2,165	1,414	1,650	1,782
Nebraska	2,379	3,040	2,034	2,525	2,803
Oklahoma	1,284	1,637	1,119	1,300	1,404
Texas	8,249	7,131	5,121	5,482	4,660
Wisconsin	1,148	1,081	1,216	1,340	1,394
HORSES:					
Total, U.S.	17,058	21,040	21,195	21,210	21,563
Illinois	1,232	1,655	1,467	1,452	1,467
Indiana	636	847	854	845	837
Iowa	1,144	1,447	1,600	1,552	1,583
Kansas	880	1,187	1,132	1,120	1,142
Missouri	809	1,005	1,095	1,020	1,040
Nebraska	795	1,045	1,038	1,018	1,049
Ohio	785	977	910	892	883
Oklahoma	354	804	758	730	737
Texas	1,277	1,369	1,192	1,200	1,212
MULES:					
Total, U.S.	2,889	4,123	4,479	4,723	4,824
Alabama	161	253	281	278	289
Georgia	201	248	309	324	334
Mississippi	219	290	292	292	307
Tennessee	163	290	275	270	273
Texas	391	702	753	800	808
SHEEP:					
Total, U.S.	45,170	57,216	49,956	47,616	48,900
Arizona	816	1,020	1,761	1,632	1,550
California	2,180	2,372	2,500	2,524	2,776
Colorado	1,458	1,729	1,751	1,950	2,086
Idaho	2,978	4,248	3,041	3,170	3,202
Michigan	1,759	2,151	2,033	1,834	1,926
Missouri	770	957	1,490	1,370	1,466
Montana	5,638	5,747	4,379	3,500	3,045
New Mexico	2,856	4,729	3,340	3,300	3,135
Ohio	2,601	3,203	3,263	2,944	3,091
Oregon	2,546	2,581	2,563	2,400	2,448
Texas	1,617	1,909	2,114	2,328	2,188
Utah	2,344	3,177	2,068	2,089	2,340
Wyoming	3,267	7,316	4,427	4,100	4,100
SWINE:					
Total, U.S.	47,321	47,782	64,618	67,503	71,374
Georgia	1,396	1,647	2,042	2,585	2,766
Illinois	3,747	3,772	4,358	4,444	5,111
Indiana	2,631	2,578	4,167	3,970	4,168
Iowa	7,290	6,485	8,720	9,370	10,307
Kansas	1,949	1,942	2,656	2,535	2,560
Missouri	3,110	2,714	4,250	4,280	4,708
Nebraska	2,888	3,201	3,809	4,200	4,200
Ohio	2,701	2,047	3,640	3,527	3,774
Texas	2,525	3,205	2,880	3,229	3,068
Wisconsin	1,653	1,651	2,225	2,060	2,019

AGRICULTURAL STATISTICS FROM CENSUS OF 1910

(*Yearbook of the Department of Agriculture*)

	Total	Per-cent age
Land area (acres)	1,903,290,000	.....
Farms (acres)	878,798,000	46.2
Improved (acres)	478,452,000	54.5
Woodland (acres)	190,866,000	21.7
Other unimproved (acres)	209,481,000	23.8
Number of farms	6,361,502	.....
Average area per farm (acres)	138.1	.....
Average area of improved land per farm (acres)	75.2	.....
Farms under 20 acres	....	13.2
Farms of 20 to 99 acres	....	44.8
Farms of 100 to 499 acres	....	39.2
Farms of 500 to 1,000 acres and over	....	2.8
Value of crops of Continental U. S.	$5,487,161,223	.....
Value of all farm property, and per cent. increase	$40,991,450,000	200.5
Vale of land	$28,475,674,000	218.1
Value of buildings	$6,325,452,000	177.8
Value of implements and machinery	$1,265,150,000	168.7
Value of animals, poultry and bees	$4,925,173,000	160.1
Value of all property represented in—		
Lands	....	69.5
Buildings	....	15.4
Implements and machinery	....	3.0
Animals, poultry and bees	....	12.0
Average value per farm of—		
All property	$6,444	.....
Lands and buildings only	$5,471	.....
Average value of land per acre	$32.40	.....
FARM EXPENSES		
Labor:		
Farms reporting	2,922,288	.....
Per cent. of all farms	....	45.9
Cash expended	$521,727,000	.....
Rent and board furnished	$129,878,000	.....
Feed:		
Farms reporting	2,368,905	.....
Per cent. of all farms	....	37.2
Amount expended	$299,839,000	.....
Fertilizer:		
Farms reporting	1,823,032	.....
Per cent. of all farms	....	28.7
Amount expended	$114,884,000	.....
NATIVITY OF FARM OPERATORS		
Number of farms operated by—		
Native white	4,771,063	.....
Foreign white	669,556	.....
Negro and other non-white	920,883	.....
Percentage of operators who own their farm among—		
Native white	....	66.3
Foreign white	....	81.4
Negro and other non-white	....	26.2

XVII. THE MINERAL INDUSTRIES

MINING AND ORE DRESSING

Charles E. Locke

The Mining Industry.—The year 1918 will be noted for the "high cost of mining" as a necessary accompaniment of the "high cost of living". The miner has been favored with high prices for his product but has had to contend with increased costs of labor, supplies, freight, etc., all along the line, with a labor shortage, with deceased efficiency of the laborer, with higher taxes, with Government regulation of prices, and even in some cases with railway and smelter embargoes. To a certain extent the high prices have neutralized the adverse factors, and although some classes of mines have shown decreased profits, others have obtained increased profits. Such evidence as is afforded by mining dividends indicates that the country on the whole will receive a profit from its mines that may be expected to be nearly on a par but not to exceed that of a normal year.

With the handicaps mentioned above, the output of the mines has not equalled the owners' desires or even in some cases met the country's demands. Iron-ore shipments from Lake Superior ports to Oct. 1 totalled 48,321,278 tons, which is over two million tons ahead of 1917 but not quite up to the record year 1916. It is a question whether the total of 1918 will equal that of 1916 on account of the late opening of lake navigation and the lack of men and ships (see also *Iron and Steel, infra;* and XII, *Economic Conditions*). Copper production has been held back somewhat by reduced refinery capacity due chiefly to loss of men (see also XII, *Economic Conditions*). The coal crisis of the winter of 1917-18 will be memorable but this was due mainly to transportation troubles.

The mining of certain ores in which the United States is not independent, and especially those for which the war has created an unusual demand, has been stimulated. This includes pyrite, manganese, potash, tin, platinum, chrome, graphite and antimony. The increased price of petroleum has turned attention to the enormous deposits of oil shales in the West. This new industry is bound to grow as time goes on. (See also IX, *U. S. Geological Survey.*)

On the other hand, the gold miner stands out alone as a great sufferer from the war and the gold-mining industry is passing through a crisis in which some relief must be given. Gold production is hardly holding its own. Some mines, as in the Porcupine district, have shut down rather than continue operations at practically no profit. Others have kept open from motives of patriotism in order that the Government may receive its desired supply of this standard metal even though the owners sacrifice profit by so doing. (See also *Gold and Silver, infra.*)

Prices of metals have continued far above normal but have not in general exceeded the 1917 average prices. Government control, either directly by price fixing or indirectly by other methods, has played a great *rôle* in this matter. Naturally every one has not been pleased and some high-cost mines have had to close. These mines were kept running as long as hope existed for possible higher prices. Some economists even claimed that it would be impossible to set aside the natural laws of supply and demand and establish artificial prices, but the fact remains that it has been done and on the whole the results appear to have been satisfactory. All steel is under Government control for war purposes, being distributed by the War Industries Board, and maximum prices have been established for iron ore, coke, pig iron, steel and steel products, the base price for various grades of pig iron ranging from $33.00 to $35.20 per ton, somewhat less than the high figures of the preceding year (see also XVIII, *Manufactures*). Likewise copper was fixed at 23½ cents per pound, and later 26 cents, against a maximum of 30 cents or more in 1917. Coal prices were fixed and coal distribution controlled from Washington. Platinum, palladium, and iridium are under very strict control, with prices fixed at $105, $135, and $175 per ounce respectively. The price of silver is fixed at $1.01⅛ per ounce, and aluminium at 33 cents per pound. Lead, tin, sulphur, pyrite, and manganese are under Government control but with no fixed prices. Sheet zinc has a set price, and maximum prices are given for sulphuric acid. Producers were warned that no further advances in oil prices would be allowed. As an indication of where prices will land when not fixed, we have pyrite as high as 33 cents per unit at the mine against a pre-war price of eight to ten cents per unit delivered to acid plants on the seaboard. (See also XII, *The Conduct of Business.*)

Labor strikes have been very few on account of advancing wages and the Government policy of conceding everything to the laborer. The I. W. W. are by no means inactive, however. At Butte they are agitating for a six-hour day and a $6 wage. (See also XV, *Labor.*)

Mining Methods.—On the technical side of mining an increased use of cement and concrete is to be noted for lining shafts and haulage ways. The cement gun is applied to the spraying of liquid cement. Shaft timbers at Butte were coated in this way as a fire protection. The protective coating will probably also prolong the life of the timbers. Other applications are to the coating of steel underground and to the covering of rock faces, which, when exposed, are acted on by the air and swell and flake off. Pneumatic hammer drills of the one-man type are in use for all kinds of work, the Seneca shaft at Lake Superior having been successfully sunk with these tools. Mechanical shovelers underground are on trial in Missouri and in Minnesota and appear to be a great boon in the present labor shortage. At the Quincy mine at Lake Superior a hoist is being installed to lift from 10,000 ft. depth on the incline. Only a few years ago this was considered to be beyond the limit of economical hoisting. For ventilating the hot lower levels at Butte, canvas tubing is in successful use for bringing cool air direct to the miner at the working face.

Ore Dressing.—In ore dressing there has been no marked change. New mill construction has been held back by high prices and shortage of building materials. Flotation is still making great progress. The operators are still eagerly awaiting the outcome of litigation, the latest decision being that of the U. S. Circuit Court of Appeals, in the Butte & Superior case, that the Minerals Separation Co. patent is not infringed when over one-half of one per cent. of oil is used (see also *Gold and Silver, infra*). This case will probably go next before the U. S. Supreme Court. There are indications that vanners, which have been largely discarded in recent years, may come back into use to some extent.

COAL, COKE, AND PETROLEUM

R. Dawson Hall

Coal Mining. — At last electric shovels of steam-shovel type have worked their way into the mines. They have already been used extensively to strip away the cover of the coal and to lift the mineral thus exposed. Now in a mine at Hanna, Wyo., they are being successfully employed for the purpose of loading coal underground. The use of the shovel for this purpose, however, is strictly limited, for only in mines with coal eight feet thick or over is there room for its operations, unless further modifications are effected.

Coal Separation. — If coal as it comes from the mine be dropped into a liquid of high specific gravity, such as a solution of zinc chloride, the clean coal will float in the liquid while the impure coal will fall to the bottom. Hitherto this method of separating good from bad coal has been used only in the "float-and-sink" test—not for purposes of economic separation, but for the determination merely of the percentage of passable and not-passable coal. Because the solutions in which coal will float are so expensive and because they adhere to the coal, the float-and-sink test will probably never be used commercially for coal separation.

T. M. Chance has suggested that by agitation fine sands might be used to convert water into an artificially dense liquid in which coal would float. The method proposed has all the certainty of the float-and-sink test, and it is capable of adaptation to commercial uses. The fluid being obtained at the right specific gravity, coal above that gravity instantly falls to the bottom of the container, while the purer coal floats at the surface of the water. Both clean coal and impure coal can easily be removed by machinery, the sand disengaging itself freely from the coal and slate on their leaving the fluid.

As the method of agitation chosen has frequently been jets of water discharged from pinholes, the tendency is natural to regard the separating action as one of "hindered settling", but the agitation need not be directed upward, nor is it at all essential that jets of water be employed for the purposes of agitation. Any agitation that keeps the sand in suspension will provide for the required selective action of the liquid.

Coal Distillation.—It has long been known that the coking temperature of coal is so high that in distillation coal which is exposed to it does not give a maximum yield of benzol and other oils. Coal has been distilled at low temperatures for many years, notably in England. During the year 1918 the success of a number of experiments at Irvington, N. J., was made known to the public, and a large plant for making the fuel is under construction. It seems possible that the new fuel will serve largely in domestic use to replace anthracite. It has enough volatile matter to make a good marine-boiler and locomotive fuel. The crushed coal is heated at about 900° F. Gases and tars are driven off. The semi-coke is then briquetted with pitch obtained from the process and exposed to a temperature of 1,800° F. All the gas generated is at present used in the conduct of the process, but before the gas is burned for the generation of heat every particle of oil is removed from it. When the difficulties of manufacture are completely overcome, it is likely that the new fuel will aid in answering the question: "Where shall we find a fuel to replace anthracite?", for the production of hard coal promises from now on to be unequal to the demand.

A number of experiments of low-temperature distillation on a commercial basis have been made in Illinois. The coal is put into a nest of boxes supported on a truck. The trucks are pushed slowly through a coking chamber in a long train, each truck being admitted and emitted through an airlock. The product proved to be a good locomotive fuel, of practically homogeneous structure.

Utilization of Methane.—The Delaware, Lackawanna & Western R. R., Coal Department has been conducting experiments to prove or disprove the feasibility of obtaining power from the methane in the mine atmosphere. It is an easy problem to determine the thermal value of all the gas exhausted from the anthracite mines and to stress the great heating power it might provide if properly used. Unfortunately the only known method, and it is the one being tried by the company mentioned, at its Loomis colliery, is to use the mine exhaust, instead of pure air, under the boilers. The mine exhaust contains about one per cent. of methane and lacks about one per cent. of normal oxygen. It will doubtless help the coal to generate heat, but the amount of mine gas that can be so utilized is almost negligible as compared with the immense volume available and demanding provident use.

Utilization of Pyrite.—Some progress has been made in the use of the pyrite of coal mines for the manufacture of sulphuric acid. The Gillespie Coal Co. in Illinois has erected a plant for the separation of pyrite from the coal with which it is associated, and the Consolidation Coal Co. in West Virginia is about to convert some of the pyrite of its mines into sulphuric acid.

Petroleum.—The losses due to the improper handling of the water in oil sands have been so great that it is estimated that only 10 to 20 per cent. of the oil is recovered, whereas with better methods 50 to 75 per cent. of the oil should be obtained. Hager and McPherson are authority for the statement that in the North Cushing field the Ohio Cities Oil Co. by cementing in the wells those sands that were barren of oil so bettered production that wells which were giving three to 20 bbl. of oil apiece before shutting off water, after cementing showed an increase of from 10 to 150 bbl. of oil. Whereas before they had yielded from 100 to 150 bbl. of water, after cementing they delivered only one to 10 bbl. of water and some even made none. The casing-head gasoline content increased from 400 gal. to over 1,400 gal. per day. Lifting expenses were greatly reduced, as the well pumped 90 to 100 per cent. of the time instead of 40 to 60.

The study of salt domes still proceeds, it being felt that until a clearer idea of their origin is obtained it will be impossible to find a safe basis for predicting where to drill for oil in such structures. Four theories are regarded as having some degree of probability. The Hager theory is that molten intrusives caused the generation of vast quantities of gas by the reduction of metallic sulphides and the distillation of lignites, and that these gases accompanied by steam forced their way to the surface through the unconsolidated sands and clays, giving rise to mud volcanoes. Norton ascribes the domes to sedimentation, and Harris believes they arise from the upward pressure exerted by the force of growing crystals. Van der Gracht postulates a bedded salt deposit, and declares that under great pressure and moderate temperature this would become plastic and rise along lines of weakness, much as molten igneous rock rises to form a plug or laccolith.

COPPER

L. S. Austin

Open-Cut Mining. — At Chuquicamata, Chili, a face of rock is exposed up to 160 ft. high. This is blasted and broken up, one-fourth to one-half million cubic yards being loosened at a time. Where the bank is but 30 to 50 ft. high, the charges are put into a line of churn-drill holes parallel to the face. The bottoms of the holes are "sprung" or enlarged by means of small dynamite charges, the enlargement filled with powder, and the entire line exploded simultaneously by electricity. The loosened rock is then removed by steam shovels, pieces too large for the shovel being block-holed, that is, drilled and exploded by hand. For a high face a different method of loosening is pursued. A shaft is sunk well back from the face to 10 ft. below the level of the power shovel track. A drift is run forward, then cross drifts parallel to the working face and two-thirds its height back of it. Each of the cross drifts is filled with black powder with a charge of dynamite set in it and wires run from the charges so that the whole system may be fired electrically at once. Enough explosives must be used to break up and crumble the whole mass ready for the shovel. Easily $50,000 may be spent on a single blast.

Excavation of Leaching Tanks.—At Ajo, Ariz., 12 leaching tanks, 88 ft. square and each holding 5,000 tons of tailing, are arranged in two rows. These are spanned by a bridge which can be moved to command either row of tanks. On this bridge is mounted a Hewlett excavator, such as is used in unloading iron ore at the lower lake ports. A trolley on the bridge carries a balanced walking beam with a bucket-leg carrying a 10-ton bucket. The bucket can be rotated 325° in either direction about the bucket-leg, and has an offset of two feet, so that it can clean up in any position of the trolley a space of 24 ft. Excavation proceeds at the rate of 500 tons per hour or 10 hours to unload a tank. The tailings are delivered into a car standing on a track parallel to the line of tanks. To avoid injury to the tank bottoms, excavation stops at 6 in. above the bottom. The remaining ore is shovelled by hand into winrows to be removed at the next excavation.

By-product Sulphuric Acid.—Both the Tennessee Copper Co. and the Ducktown Sulphur, Copper & Iron Co. have large plants where they make sulphuric acid from their blast-furnace gases which will average 6.5 per cent. $S O_2$. The former company, indeed, has found this manufacture more profitable than the copper smelting. Several western plants make acid chiefly from roaster gases. The acid is then used for the hydrometallurgical treatment of their leaching ores.

Reverberatory Furnace Improvements.—At Douglas, Ariz., and at other southwestern plants the tonnage output of reverberatory furnaces has been increased. The area at the verb has been enlarged and the uptake in these 100-ft. furnaces increased to 70 cu. ft. With this larger draft opening it has been possible also to increase the size of the burners, formerly ¾ in., to 1¼ in. in diameter, and so, by burning more fuel, to melt larger tonnages. A furnace of 700 tons has smelted to nearly 1,000 tons daily. The amount of oil per ton of ore smelted has dropped in one instance from 1.15 to 0.78 bbl. per ton. These performances have been accomplished by increasing the air supply, which gives a shorter and hotter flame, so that the smelting is more largely done at the fire end. This leaves a quiet area toward the front for settlement of the matte from the molten bath. It may be said, however, that this intense flame has tended to shorten the life of the furnace arch and so shorten the furnace campaign. Shutting down a furnace to cool it off, to repair it and finally to bring it again into full action may take the better part of a month.

At the Copper Queen plant, Douglas, Ariz., the roof of a 100-ft. furnace was raised and two banks of burners put in, using low-pressure air for injecting and heating the oil to 140° C. at 80 lb. pressure. This furnace has averaged a daily output of 680 tons with a fuel ratio of but 0.55 bbl. of oil per ton of ore, and for a short period, to 0.48 bbl. The calcines enter the furnace at 480° C. It is computed, that were it possible to deliver the calcine at the full roaster temperature, this fuel consumption might be reduced to as low as 0.30 bbl. per ton.

Reverberatory smelting increases in speed the hotter the calcines that are delivered to it. Their temperature on the lower roaster hearth will be 700° C. but by the time they enter the reverberatory they will have lost 250° C. It is hoped to save some of this loss by insulating the discharge hoppers and using large calcine cars for transfer to the furnaces.

Cleaning Converter Slag.—Attempts to remove the two or three per cent. of copper still retained by converter slag by pouring into a blast-furnace forehearth or into a reverberatory furnace have failed. This slag, high in iron, does not mix with the furnace slag but sinks beneath it little changed. By additions of silica in the converter it has been sought to make a highly silicious and consequently lighter slag that would mingle with the furnace slag and be subject to the same cleansing influences. At Anaconda, Mont., at a 130-ft. reverberatory in the converter building, the problem is thus solved. The converter slag, making about one-half of the charge, is poured into the furnace, the other half being a mixture of calcined and raw concentrates, together with silicious ore used as a protective layer or bank lining the sides of the furnace. About eight per cent. of powdered coal is used to smelt the charge. The sulphur in the raw concentrates reacts on the iron oxides of the converter slag, producing matte which, falling to the bottom through the bath, carries down most of the contained sulphur, while the cleansed slag flows away at the furnace front.

In competition with the Great Falls upright converter, the Smith-Pierce is operating with satisfactory results. The diameter of this horizontal converter has been increased to 13 ft., doubling its capacity. For charging and distributing the needed silica the Garr silica gun is used. This gun, injecting the ore above the charge at one end of the converter, permits even distribution of the silicious ore in a moist condition over the molten bath without danger of an explosion, thus producing a uniform temperature throughout the converter. Moreover, the campaign lasts much longer. In one such campaign there was produced 15,300 tons of copper, or 103 tons per converter-day.

Powdered-Coal Firing.—At Garfield, Utah, pulverized coal is blown into the reverberatory through flat burners, which are found to be better than round in keeping the flame from the furnace roof. Increased efficiency has been attained by grinding the coal so fine that 85 per cent. will pass 200-mesh. The consequent increase of surface of the coal particles together with its intimate mixture with air makes for a shorter and hotter flame. The amount of coal dust and air must be relatively controlled; a good proportion is 50 cu. ft. of air per pound of coal. Another factor in quick burning is that the kindling temperature in the combustion area shall be high —even higher than for oil or gas.

Fume Treatment.—A new fume-treatment plant at Anaconda, Mont., estimated to cost $2,000,000, consists of a great stack, flues and 20 fume-treatment chambers or "treaters." From the main flue two branch flues each divided into four lead to the treaters. The gases, leaving the bottom flues of each branch, pass through 10 treaters, where the solid dust and fume is removed and then return to the upper flues which lead to the stack. The treaters, of the "box" type, consist of a series of corrugated plates, 24 by 21 ft. area, hung at 12-in. intervals. Between the plates are hung chains transmitting a current of 75,000 volts which acts on the rising ore particles, repelling them to the plate surfaces. When one of the units is shut off and by-passed, the dust is jarred from the plates and, falling to a pocket below, is withdrawn for further treatment. The dust is smelted in a reverberatory furnace, yielding matte, slag, some dust, and volatilized arsenic. The escaping dust is caught in a hot treater. The cleaned gas is then cooled in a succeeding flue to such a temperature that the arsenic vapor present drops out in solid form. This product, 92 to 96 per cent. pure, is then marketed. The remaining gas goes to the main stack. The top of the main stack, 60 ft. in diameter, will be 585 ft. above its foundation, this foundation, on a high hill, being 454 ft. above the reverberatory furnaces of the plant, thus giving a total draft height of 1039 ft. This enables the smoke to escape high above the valley, and, already freed from arsenic, it can do but little damage to the crops.

GOLD AND SILVER

HERBERT A. MEGRAW

General Conditions.—The production of gold and silver in the United States during 1918 has not continued at a rate equal to that of the immediately preceding years. New conditions have arisen that have affected production, principally in respect to the cost of recovering the metals. In the case of gold this is particularly true. The continued increasing cost of all materials concerned in gold mining and metallurgy, together with the increased labor cost, has made gold production decreasingly profitable and in many cases has brought about the total elimination of profits. Many gold mines have had to reduce their scale of operations to a minimum and others to cease operations altogether. The economic question of the relation of gold to material values may be left to the economists; there remains, however, the apparent diminution of the value of the monetary standard to a point at which it is no longer profitable to produce it.

With silver the condition is different. While the cost of production (materials and labor) has risen, as with gold production, the market value of the metal has increased also, and in such proportion that, although profits may have suffered diminution in some instances, the industry as a whole has prospered. The demand for silver has been good and the price has shown a continuous increase since reaching its low point in February.

Gold Production.—The production of gold in the United States in 1917, according to revised figures published late in 1918, amounted in value to $82,304,500. The Philippines and Porto Rico added $1,446,500 to this total. This figure was $8,839,600 less than the 1916 production. California continued to be the principal gold-producing state, with a total of $20,929,400, which is about one million dollars less than its production in the preceding year. In 1918 the production has continued to diminish—not rapidly but certainly.

Silver Production.—Silver production in 1917 amounted to 71,727,647 fine oz. in the United States and 12,715 fine oz. in the Philippines. Porto Rico produced no silver. The total, 71,740,362 fine oz., was 2,674,440 oz. less than the production for 1916. Montana was again the leading silver-producing state, with a record of 14,555,034 fine oz., 508,080 oz. more than its production in 1916.

Notwithstanding the high price of silver and the demand for it, the production in 1918 cannot be expected to be materially greater than in 1917, and it may even diminish, as it did between 1916 and 1917. Only about one-third of the United States production of silver is from purely silver ores, the remainder coming from lead and copper ores or from the output of lead and copper smelteries. Consequently any material increase of silver production would have to be accompanied by corresponding increases in the production of lead and copper. Since such increases are not feasible, or not desirable, an increase in the silver produced through them is not probable. Increase through greater production of purely silver ores is possible but by no means certain, so that any great increase of silver production for 1918 is hardly to be expected.

The silver production of Mexico will probably show no great increase over that of the past year or two. Mexico is quiescent politically—probably by contrast, but there has been no material increase of industrial activity. Canada is producing at a diminishing rate, hampered, as the industry is, by war conditions.

Silver Prices.—The market price of silver has shown a fairly continuous rise during 1918, except from January to February. The average quotation for January was 88.702 cents per ounce, whereas that for February was 85.716 cents. In March the average was up to 88.082 cents, in April 95.346, and in May, 99.505 cents per ounce. Subsequently the change was only fractional from month to month, the September average being 101.125 cents per ounce.

The advancing price of silver is due, no doubt, to a multiplicity of causes, but the principal of these is the situation in the Far East. Silver is the principal medium of exchange in India and China and it is one of the principal forms of accumulated wealth. Due to the reservation of gold by the Great Powers, its burden has been increased during the war; hence the increased demand for it. (See also XIII, *Banking and Currency.*)

Gold Mining and Metallurgy.—In metallurgy of gold there have been some advances during the year. These, however, have not been in the way of new processes, but rather as developments of older ones. A process of precipitating gold from aurocyanide solutions, known as the Moore-Edmands, by the use of granulated charcoal, has been announced. Charcoal precipitation is not new, but the new process is designed to avoid the drawbacks of the previous practice and to combine the old advantages with the new ones of practicability and economy. The method is said to have been adopted at plants in Australia and in South Africa.

Flotation has not made great headway in the treatment of gold ores, nor is it expected to do so. Although gold in native form has been successfully floated, it is much more likely that gold metallurgy will still adhere more closely to amalgamation and the cyanide process, at least until the superiority of some other process has been definitely proved.

The great gold-mining districts of the country—South Dakota, Nevada and California—continue production, but at a somewhat lower rate. In Canada the Porcupine district has continued to operate, but has had difficulties in common with all gold-mining districts during the year. In fact, the total gold production of Canada was valued at only $15,449,426 in 1917, the lowest since 1912, when Porcupine came into production. The Mexican gold producers, principally at El Oro, in the state of Mexico, have continued as in the preceding year. The year has not been a notable one for gold mining and metallurgy.

Silver Mining and Metallurgy.—In the metallurgy of silver no notable advances have been made. Flotation continues to be the principal figure in the industry, and, although only a few purely silver ores have been concentrated by flotation, an increasing proportion of lead and zinc ores, often bearers of silver, are so treated. The improvement in the recovery of these metals involves the recovery of additional quantities of silver. Besides, the differential separation of lead and zinc by flotation is being developed, and this promotes the treatment of ores hitherto without value. Since such ores may contain silver, additional quantities of that metal are thereby made available.

Flotation litigation had another hearing in 1918. The case of Minerals Separation Co. against Butte & Superior, after an opinion in favor of the former in 1917, was appealed. The case came before the U. S. Circuit Court of Appeals at San Francisco, and on May 13, 1918, a decision was filed which was largely in favor of Butte & Superior. Judge Ross decided that the use of more than 0.5 per cent. of oil by weight of the ore does not constitute an infringement of the Minerals Separation patents. Of course the litigation will not end at that point. The U. S. Supreme Court will probably have to explain its decision wherein the Mineral Separation patents were construed to be limited to the use of less than one per cent., or "a fraction of one per cent.", of oil. Progress has been made, however, in flotation without the use of oil, other frothing agents taking its place. The details of such experiments, naturally enough, have not yet been made public.

The large silver mines of the country have all been in production during the year. Colorado, Nevada, Utah, Idaho and Arizona mines have been worked as intensively as possible. The Canadian mines have been producing also. The Canadian production in 1917 was 22,150,680 fine oz., a decrease of 3,309,061 as compared with 1916. The 1917 production was worth more than that of 1916, due to the increased price of silver.

IRON AND STEEL

EDWIN F. CONE

General Conditions.—So completely has the iron and steel industry of the United States been absorbed in producing steel for war purposes in 1918 that practically no time has been left for other matters. As in 1917 any recorded advance has been mostly of a commercial nature. Production has been pushed to the limit in both pig iron and steel; in fact, very little time has been left for the necessary repairs to plants. Throughout the year, even after the signing of the armistice, the maximum prices for pig iron and all of the principal grades of steel products were rigidly maintained (see also XII, *Economic Conditions*), but as the year drew to a close, it was announced that price regulation would cease on Dec. 31. Just what the steel output was is difficult to gauge. So busy has the American Iron and Steel Institute been with governmental affairs that in early December the final figures for the output of steel in 1917 had not been published.

The feature of the year was the development of the ordnance programme of the United States and the methods used to meet the enormous demand. An authority states that the estimated output of finished steel in the first half of 1918 was about 17,000,000 tons, while the war needs alone in the last half were put at 21,000,000 tons. It was the task of the Director of Steel Supply, J. Leonard Replogle, of the War Industries Board, to meet this deficit. That it was done successfully was due to the loyal coöperation of the men of the American steel industry.

It is probably true that considerable progress was made in the metallurgical phase of the industry, but much of this was due to war study and research and a good deal of it cannot come out until peace has been assured.

An important development late in November was the announcement of the formation of a new export company for steel and iron. Representatives of 28 companies outside of the U. S. Steel Corporation were planning the formation of the Independent Steel Products Corporation, this being permissible under the Webb Act. These companies produce a total of about 20,000,000 tons of ingots per year, and it was understood that they would devote about 10 per cent. of their output to foreign trade. The movement is one of great importance to the steel industry.

Pig Iron and Steel Production.—The pig-iron output in the first half of 1918, as reported by the American and Steel Institute, was 18,227,730 tons, as compared with 19,258,235 tons in the first half of 1917 and with 19,362,981 tons in the last half. Of the 1918 first-half output, 17,933,932 tons was coke pig iron. According to monthly data published by the American Iron and Steel Institute, the production of steel ingots in October, from reports of 29 companies in the United States which made 85.10 per cent. of the 1917 total, was at an annual rate of 46,699,360 gross tons, exceeding the September rate by 256,920 tons. This estimate is based on the output of 3,343,916 tons by these companies for October. The lessened pig-iron output was due largely to coke and transportation troubles in January and February because of an unparalleled winter, and to the excessive heat in August and the influenza epidemic in the fall. (See also XII, *Economic Conditions.*)

Iron and Manganese Ore. — The movement of iron ore from the Lake Superior region, while large, was not as large in 1918 as in 1916, but it exceeded the 1917 movement. To Nov. 1, 1918, the total for the season had been 56,870,871 tons, or 2,617,273 tons more than for the same period in 1917, an increase of 4.82 per cent. Developments in manganese ore were striking and far beyond the most optimistic dreams of 1917 (*A. Y. B.*, 1917, p. 475). The 1918 output, while not officially known, had grown so as to be able to supply one-third of the domestic needs, against one-sixth in 1917. In the first six months of 1918 the ore shipments containing 35 per cent. manganese were 136,554 tons, and it is estimated that the last six months of this year will record shipments of 324,000 tons.

Ferromanganese. — In connection with the foregoing, attention should be called to the remarkable record made in ferromanganese. Rapid strides had been made in 1917 toward a greater independence in the domestic manufacture of this alloy, but 1918 eclipsed all previous attainments. The average output per month in 1917 was 23,833 tons, but for the first half of 1918 it had advanced to 26,670 tons per month; later months of the year greatly exceeded this and probably averaged more than 30,000 tons per month. In 1916 the average was only 18,641 tons per month, and that for 1913 only 9,958 tons per month. Before the war one-half the domestic consumption consisted of imports from Great Britain; when the war closed, imports had almost ceased. Up to Nov. 1, 1918, the total output of domestic ferromanganese had been over 285,000 tons, as compared with 257,834 tons in all of 1917. Exports had also been made, the first in the history of the trade.

A feature of the later development in this industry was the expansion in the number of electric furnaces making ferromanganese, there being late in 1918 six companies using this process. Before the war very little if any was made in this way, and the method is feasible only when prices are high. Before the war the 80 per cent. British alloy sold as low as $38 per ton; late in 1918 the price had settled to $250 for the 70 per cent. alloy. (See also XXIII, *Electrochemistry.*)

Ferroalloys.—France before the war led in the production of ferroalloys, particularly as made by the electric process. Paul Girod was a pioneer in this field. His products were introduced in all steel-making centers of the world. Germany occupied a less prominent position, but her work in this line was growing in importance, particularly as regards control of the tungsten resources of Great Britain and as a seller of ferrotungsten to other countries. Great Britain had not yet awakened to the possibilities of ferroalloys and the United States was not far ahead of her.

A striking transformation has taken place in the last four years. Today without doubt the United States leads the world in the production of all kinds of ferroalloys. More ferromanganese is produced here than in any other country, and it is not improbable that we may partly displace Great Britain as an exporter to Canada. These exports recently have grown larger with each month. In ferrosilicon, both high and low grades, decided progress has been made quite recently in the electric grades (see also XXIII, *Electrochemistry*).

In other ferroalloys, particularly those of tungsten, chromium and molybdenum as well as those of vanadium and uranium, development has been noteworthy in this country as the war has progressed. Much of this expansion has taken place in the Central West in Colorado, Utah and Montana and also in California. The movement has become one of national significance particularly in the West. In addition, the ferromanganese developments of Montana and the western coast have been important. In ferrochromium alone California occupies a new and prominent position.

Not only as a producer and user but also as an exporter of ferroalloys the United States has taken a new position. Before the war our steel companies were importers of ferrotungsten, but for the fiscal year ended June 30, 1918, the exports were over 2,000,000 lb. Very little ferrovanadium was exported before the war, but in the last fiscal year the amount sent abroad was also over 2,000,000 lb. and in 1916 it exceeded 2,500,000 lb. Most of the ferromolybdenum now made here is also exported, and the demand from foreign countries for our ferrotitanium in the war period has been remarkable. Indications are that ferrozirconium also will soon occupy an important place among American-made ferroalloys.

The future of this industry is hard to forecast, but the call for American ferroalloys for making steel to compete with or to keep out foreign high-grade steels promises to continue. Throughout the period of reconstruction in Europe it is likely that the demand for certain of these alloys from this country will be large.

By-Product Coke.—The feature in this industry in 1918 was the fact that the by-product coke output passed the production of beehive coke for the first time about the middle of October. It had been estimated that if they continued at the rate of growth established a few years ago, the by-product ovens would attain an output equal to that of the beehive ovens in 1923, but the tremendous impetus given to retort production by the war in its demand for toluol and other by-products has caused rush work on new installations, with a consequent increase in capacity. In the week ended Nov. 2 by-product coke production was estimated at 577,000 tons, and that of beehive coke at 558,000 tons. In the *Iron Age* of Jan. 3, 1918, the capacity of by-product coke, as of Jan. 1, was given as 26,005,400 tons, and it was estimated that the capacity of plants likely to go into operation in the course of the year was 7,795,000 tons. At the beginning of the year there were under construction for completion in 1918 a total of 1,844 ovens.

An authority on by-product coke expresses the opinion that the product of the retort oven will hold its lead as, in his judgment, the newer ovens will run when the beehive ovens do not. He believes that mine owners who also own beehive ovens will in many cases ship their coal rather than coke it.

Electric Steel.—On Jan. 1, 1917, according to the *Iron Age* review, the United States was credited with 136 electric steel furnaces of all types, with 19 in Canada. On Jan. 1, 1918, this total had increased to 233 in the United States, and to 36 in Canada; of this total there were 126 Heroult furnaces in the United States, and 20 in Canada. Data as to the number of furnaces in the world outside the United States and Canada are largely estimates, due to the war.

These calculations showed, however, 269 such furnaces of all types in the steel industry, bringing the world's estimated total to 733 on Jan. 1, 1918, as against 471 on Jan. 1, 1917. Three years before, on Jan. 1, 1915, this total was only 213. Great Britain ranked next to the United States with 131 furnaces on Jan. 1, 1918. While the advance in this industry in 1918 has probably not been as marked as in 1917 as to number of furnaces, it has probably surpassed all previous years in quantity of steel made by this process. (See also XXIII, *Electrochemistry.*)

A feature of the year's progress in the electric-steel industry was the successful and continued operation of the largest electric-steel plant in the world, the one at the Illinois Steel Co., South Chicago (*A. Y. B.*, 1917, p. 476). It consists of three 30-ton Heroult furnaces where steel is being made by the triplex process, the use in combination of the Bessemer converter, the open-hearth furnace and the electric furnace. This plant has demonstrated that steel of high quality can be made in quantity. A portion of the plant's output in the latter months of the war was nickel-steel ingots for high-grade guns of large calibre, heretofore only thought possible to be made in acid open-hearth steel. Another contribution of this phase of the steel industry to the war has been the production of a great quantity of high-grade ordnance steel castings.

Blast Furnaces.—Nothing that can be considered revolutionary in its influence on blast-furnace practice or its future has come to the surface in 1918. Efforts have been made to establish the Cottrell precipitator as a necessary unit in blast-furnace plants. Its success, however, as a blast-furnace installation will no doubt be limited to plants consuming ores, coke and limestone of high potash value. The Dorr thickener has attracted considerable attention during the year. This machine bids fair to prevail in many plants where gas-washer water is required to be kept very clean, such as where discharged into shallow rivers and canals. It will easily pay for itself in the salvage of thousands of tons of very fine particles rich in iron, to be briquetted for recharge into blast furnaces.

Recent tests on the use of hard (magnetic) ores in steep bosh furnaces indicate that the old theory of a flat bosh, say 72° to 74° for hard-ore furnaces, is not well founded. There is some reason to believe that at the time when stock distribution was not considered of most vital importance, the flat bosh or rather small hearth may have improved practice, due to penetration of blast. This, however, is a case of using one evil to cure another.

In the past year more attention has been given to general practice and improvement in details. Inferior coke, as well as poorly conditioned flux, due to lack of control in the management of labor, have no doubt brought many plants up to more scientific operation. This statement will be borne out by numerous recommendations to the effect that sulphur specifications in both steel and pig iron be made lighter.

The Brassert washer is coming into its own in the cleaning of gas for stoves and boiler use. This washer, cleaning gas almost to gas-engine requirements, is enabling many plants to change their stove checkers to sizes as low as three-inch, whereas formerly a nine-inch checker had been considered practically the minimum. This means much in economy of furnace gas and reduction of stove equipment.

Increased use of low-volatile coals in coking practice has brought out more than ever the necessity of clean coke for furnace use. In a number of plants, however, coke screens have been opened up from ¾- to one-inch size.

Blast-Furnace Potash.—One of the remarkable metallurgical and economic results of the war has been the production of potash salts as a by-product from sources hitherto passed by, and one country has the distinction of having developed in this way an output equal to its entire prewar needs. The iron blast furnace is furnishing a large part of the new supply. That blast-furnace dust contains potash salts which are recoverable in commercial quantities was discovered by an American blast-furnace superintendent, W. J. Wysor. The data regarding this, published in the *Iron Age* of Jan. 18, 1917, have been the incentive of widespread investigation. In Great Britain the results have been striking. The ores there used seem to be especially adaptable to the recovery of potash and it is an interesting fact that the addition of salt to the charge has increased the output. At one plant large quantities are produced each week, and it is stated that the country's output can easily be increased to 50,000 tons a year, or enough to satisfy all demands.

An American investigator, Linn Bradley, has recently called attention to the fact that Southern iron ores, particularly those of Alabama, can be made a prolific source of potash (*Iron Age*, Nov. 7, 1918). At a recent convention of the National Fertilizer Association in New York it was shown that the 1918 output of potash would largely exceed the 1917 output of 32,000 tons, and that it would "be possible, by mobilizing all the raw material of blast furnaces and cement mills, to reach an annual production of 500,000 tons." This is nearly twice as much as formerly came from Germany, the world's principal pre-war source. Our imports just preceding the war were over 283,000 tons annually.

It was Germany's boast early in the war that at the peace conference the Allies would be obliged to beg for a renewal of the old German supply, and that as the war progressed the farms of America, Great Britain and France would show sad contrasts to their former yields. This boast has gone the way of many another from the same source. The foreign market for German potash is probably lost forever.

Ordnance Steel.—The metallurgy of gun steel has been greatly altered as a result of the war. This is particularly true in this country. As the war drew to a close steel for large guns was being made in a radically different manner from what was thought possible even early in the war. In both England and this country it was accepted practice, four years ago or less, that only acid open-hearth steel could be safely incorporated in ordnance. The gun plants especially built in this country after our entrance into the war adopted this process. The great disadvantage involved in the process is the length of time to produce a heat of such steel. The complete deoxidation, the formation of the proper slags, and the refinement of the metal consumed from 13 to 15 hours in the case of a 40- or 50-ton heat, with the utmost care necessary. As the development of the ordnance programme of the United States progressed, it was found that the large electric furnace, refining hot metal on a basic bottom, could and did produce gun steel equal if not superior to that made by the long acid open-hearth process.

While a three per cent. nickel steel was the standard alloy used for many of the guns, it is known that at one of the large British plants a plain carbon electric steel was giving entire satisfaction in the last months of the war. An interesting report, also, is that at one American plant gun steel that met ordnance specifications satisfactorily was being made in basic open-hearth furnaces—a steel that was taboo for guns before the war and later. No doubt, had the war continued much longer, the electric furnace would have been the first choice for the production of ordnance steel. It was already so employed in the Chicago district and was scheduled for some of the later gun plants. This was not so much because of the superiority of electric to acid open-hearth steel, but because the same amount of suitable metal can be made in about one-third the time by the former process.

Cast-Iron Piston Rings.—An interesting development during 1918 was the announcement of a new method of making cast-iron piston rings. An article in the *Iron Age* for Oct. 3, 1918, describes the process in detail. Briefly, it consists in pouring liquid cast-iron into a rapidly revolving permanent mold. The iron is thrown to the outside, where it congeals in the form of a practically finished piston ring. After annealing the rings possess unusual properties as compared with those cast in sand. A feature of the process is the speed of manufacture. About 16,000 to 18,000 are being made each day in the plant of the Standard Piston Ring Co. at Newark, N. J. The fastest sand moulding machine is understood to be able to turn out only about 420 rings per day.

Exports.—The stupendous export movement of iron and steel, which started in early in the war in 1915, continues large. The total for the fiscal year ended June 30, 1918, represented a value of $1,125,889,371, only a little less than for the year ending June 30, 1917, when it was $1,133,746,188. In the fiscal year of 1916 this value was only $624,087,940. (See also XIX, *External Commerce.*)

LEAD

H. O. Hofman

Production.—During the year 1918 the production of lead in the United States has shown some increase. Of the total yield 75 per cent. has come from the Central States (U. S. Geol. Survey, Press Bulletin, June, 1918). As the ores of this section of the country do not contain sufficient silver to pay for its recovery, the furnace product goes straight to market without passing through a refinery as is the case with lead bullion, the silver-bearing lead produced in the Rocky Mountain and Pacific divisions.

A New Metallurgical Treatise.—The metallurgy of lead has undergone many changes during the last fifteen years, and the older books on the subject have become somewhat antiquated. A new treatise, *Metallurgy of Lead*, by H. O. Hofman (New York, McGraw-Hill), is therefore welcome, especially as it is a new book, up-to-date in every respect, which contains the good features of the older work, *The Metallurgy of Lead and the Desilverization of Base Bullion.*

Smelting.—The smelting industry has undergone no radical changes during the year. There is, however, a marked tendency to replace manual labor by machinery as far as this is possible. The older plants in which mechanical handling and operating have not yet been introduced form a striking contrast to the younger, in which from receiving of ores to delivery of products machinery has taken the place of hand labor. This is very evident in the new smelting and refining works of the Bunker Hill and Sullivan Mining and Concentrating Co. at Kellogg, Idaho (*A. Y. B.*, 1916, p. 497), which are in full operation at present and are being enlarged to have greater working capacity.

An ideal layout of a silver-lead smeltery and refinery, with general plan and some sections, has been described by G. C. Riddell (*Eng. and Min. Jour.*, cvi, 1918, p. 115). The works are to treat from 1,000 to 3,000 tons charge per day. This calls for careful planning of the handling of materials, standard-gauge tracks throughout, automatic weighing and conveying, large capacity of storage bins, blast roasting in Dwight-Lloyd machines with double treatment in order to attain a satisfactory tonnage and elimination of sulphur, automatic feeding of high-column lead blast furnaces, Cottrell smoke treaters, collecting of matte in settlers carried by trucks, and handling of waste slag in sectional steel pots of five tons capacity.

Mechanical roasters require for their best work ores that are not too fine. The production in ore-dressing plants of large amounts of flotation concentrates has made very difficult the problem of roasting. An excellent solution of the roasting of fines has been found in Australia by feeding this material, smaller than 200-mesh, properly moistened into an inclined revolving cylinder, from two to three feet in diameter and eight feet long, where, passing through the drum, the particles form porous balls or nodules which work most satisfactorily in a Dwight-Lloyd machine. Thus a serious difficulty in treatment has been overcome by very simple means.

Another feature, characteristic of Australian practice, is the height of the blast furnace and the corresponding great pressure of the blast. At the Cockle Creek works, New South Wales, the working height of the blast furnace is about 25 ft. as against 16 to 18 ft. in this country, and a blast pressure of from 60 to 70 oz., as against about 50 oz. here. The slags made contain from 12 to 13 per cent. ZnO and only from 0.75 to one per cent. Pb. Smooth running of blast furnaces, treating charges rich in zinc, was attained only when the height was increased and the furnace driven hard. With this innovation the coke consumption has been reduced, and analyses of throat gases show that the reducing power of the ascending current has been fully utilized. The slags produced with the new practice differ largely in composition from those common here; a slag with SiO_2, 23; FeO, 38; CaO, 17; Al_2O_3, 5; ZnO, 12, is characteristic, while the SiO_2-content of American slags is rarely lower than 30 per cent. and usually higher.

Another improvement in blast-furnace work, which originated in Europe and was developed in Australia, is now being adopted here. It is use of the Darby tube or "thimble-top," a central pipe, surrounded by charge, for carrying off the waste gases from the throat of the furnaces. In 1917 (Mathewson, *ibid.*, 140) all the blast furnaces of the El Paso smeltery were equipped with these tops. The advantages noted are: a better distribution of charge, a decrease in the formation of wall accretions and lengthening of furnace campaigns, a diminution of lead losses by volatilization and dusting, a reduction in the volume of gases to be drawn off, better working conditions on the feed floor, and a lower consumption of coke. The example set by the El Paso plant is being followed by other smelteries.

Refining.—The principal change to be noted in refining is the use of powdered coal in zinc desilverization. At Kellogg, Idaho, boilers, various reverberatory furnaces, kettles and retorts are fired with coal dust (Rice, *ibid.*, 91). The results have been very satisfactory as regards firing, life of apparatus, saving of fuel and labor, loss of metal, and cleanliness of operation. Another improvement is the more extended use of the Cottrell precipitator for collecting fume from reverberatory furnaces treating lead rich in precious metals.

ZINC

W. R. INGALLS

Commercial Conditions.—The zinc industry of the United States was in a depressed condition throughout 1918, this resulting from the overbuilding of smelting works and the overdevelopment of mines under the stimulation of the very high prices of 1915-17. Even before the advent of 1918 the closing and abandonment of plants had begun and this continued during the first half of 1918. In the second quarter of 1918 the spelter production of the United States was only 127,000 tons, compared with the 187,000 tons in the corresponding quarter of 1917, and the total production of spelter for 1918 will be only about 520,000 tons, as compared with the production of 682,000 tons in 1917.

By the middle of 1918 many of the smelters which had grown like mushrooms in 1916 had gone out of business forever. Such as remained were those which intended to continue in the business. But even those smelters, possessing a total of about 196,000 retorts, had in use only 110,000 retorts on July 1, 1918. There were only three smelters operating at full capacity at that time, and only one of them was an important concern. Many of the others, including some of the greatest metallurgical companies, were reduced to a basis of 40 per cent. or less. According to my estimates there was then in this country idle plant capable of producing 300,000 tons of spelter per annum, the value of which plant was probably about $10,000,000, and the idle mining and milling capacity was probably ratable at a similar figure. In other words, the immense profits of 1915-17 had been to a large extent put into new plant which is now threatened with extinction. At the same time the overhead expense of the industry as a whole has been materially increased.

Besides this bad situation in the capital account, operations were rendered increasingly difficult by further rises in the costs of materials and especially by the insatiable demands of labor. Moreover, as wages increased, the efficiency of the men, as to both quantity and quality of work, decreased. I have estimated that whereas in 1914 the average extraction of the zinc content of the ore smelted in the United States was probably about 86 per cent., in 1917 the average extraction, due to lower efficiency, was probably about 82 per cent., the average grade of the ore distilled remaining about the same, namly, about 50 per cent. Zn.

The price for spelter at St. Louis was about 7⅝ cents during the first quarter of 1918. In the second quarter it fell as low as 6½ cents, but in the third quarter it recovered and in September sold as high as 9½ cents. The advance was short-lived, however, and during the last quarter there was a steadily downward tendency, the market falling below eight cents in November, and standing at about 7⅜ cents at the end of December.

Spelter was the only one of the major metals to have a free market. The supply being superfluous at all times, there was no occasion for Governmental interference with prices, except as to high-grade zinc and sheet zinc. For the latter a maximum of 15 cents was fixed, and for the former 12 cents. Sheet zinc was steadily in great demand, for even at 15 cents it could be advantageously substituted for other sheet metals. This led to a noteworthy expansion in sheet-rolling, several new plants being built, but even so the supply was always short and the full price was realized. Not so with high-grade zinc, which fetched 12 cents so long as governmental specifications limited the supply of it substantially to the output of two producers. But upon the liberalizing of the ordnance specifications, which happened in the spring, new competition reduced the price overnight, and during the remainder of 1918 it ranged between 11 and 12 cents, being mostly nearer the lower figure than the higher; toward the end of the year it declined to nine cents and closed at 8½.

The contraction of the margin between high-grade and common spelter to about 2½ cents per pound caused the refining of the latter by redistillation to become unprofitable and the practice of redistillation has now about ceased. That process may be considered as about to disappear from the practice of zinc metallurgy and henceforth it will be regarded as one of the ephemeral developments of the war.

Metallurgy.—We now have to make a distinction between pyrometallurgy (distillation) and hydro-electrometallurgy. In the former there was no noteworthy improvement in the United States in 1918, but we learned from Australia of the successful adaptation of the Dwight-Lloyd sinterer for the desulphurization of blende. At the works at Port Pirie this was found not only to afford an improved desulphurization, but also to deliver the product in such a physical condition as to improve the results in distillation. American zinc smelters are now directing attention to this novelty in metallurgical practice, which may prove to be of material benefit to the industry.

Indeed, the conditions in the zinc industry of this country are such that our smelters will be forced to consider carefully what improvements may be made in their art. There is room for them, without even exploring any new fields. For example, the Hegeler type of distilling furnace uses in a certain district 2.5 tons of heating coal per ton of ore, waste heat being recovered in the form of steam. A neighboring works, under the same management, with Neureuther-Siemens furnaces uses only one ton of coal per ton of ore, and consuming 0.5 ton for power purposes, has a clear advantage of one ton over the Hegeler furnaces. The Neureuther-Siemens has proved to be a very efficient furnace, the fuel ratio, even with the relatively inferior Illinois coal, being as low as 0.9. A figure approximately as low is attained with the Overpelt-Rhenish furnaces at Pueblo, Col. These are, I believe, the lowest figures as to fuel consumption in the United States.

In the hydro-electrometallurgy of zinc the Anaconda Copper Co. at Great Falls, Mont., steadily increased its production. No other American plant enlarged materially. The works at Baltimore, engaged on the refining of crude spelter, was abandoned. At Trail, in British Columbia, there were difficulties. The Electrolytic Zinc Co. of Australia completed the first unit of its plant at Risdon, in Tasmania, early in the year and produced about 300 tons of high-grade zinc per month thereafter. Electrolytic zinc is produced in Japan, and serious attention is being given to the subject in France and Italy. It is seen, however, that the electrolytic process is by no means of universal application. Great Falls is still the only locus of large production, and Trail and Risdon are the only other places of considerable production. It is more and more clearly recognized that a combination of favorable economic conditions is necessary for the success of the process.

Such a combination being possessed, the greatest difficulty is with the hydrometallurgical part of the process. Unsatisfactory zinc extraction may be due to formation of zinc ferrite during the roasting, or to gelatinization of silica during the leaching. In either case circumventing is more or less costly. Minute impurities may cause great trouble in the electrolysis. Some may be very destructive of anodes, others of kathodes. Removal of them by previous precipitation may be difficult and expensive. It is these things that especially demand attention, for given a pure solution of zinc, the electrolysis proceeds easily. I am often asked whether I expect that the electrolytic process will displace distilling. I do not. However, I anticipate that much ore of the Northwest that heretofore has gone to Oklahoma smelters will hereafter be treated at Great Falls. Also, the electrolytic process should have a future in Tasmania and perhaps in some other parts of the world.

Electrothermic smelting made no headway in 1918, and indeed has practically been dismissed from consideration among experienced zinc metallurgists.

Smelters.—Although 1918 was a period of dismantling of smelteries in the United States, important works were under construction in Great Britain, which intends to develop its own industry. Plans were also entered upon for the erection of an important plant at Sakchi, India, to treat ore from Burma. Since the withdrawal of the Germans from Belgium and the north of France, news has been received that the zinc smelteries in the valley of the Meuse were not materially damaged, but that it will be an indeterminate time before they can be put into operation. The two plants in the Campine were in operation on a greatly reduced scale during the German occupation. Attention may be drawn to the fact that the restoration of Poland will result in the loss by Germany of the great zinc mines and works of Upper Silesia, which are located in a Polish-speaking part of the province immediately adjacent to the old Russian frontier.

STATISTICS OF MINERAL PRODUCTION

WORLD'S PRINCIPAL MINERAL PRODUCTS, 1900-17

(In metric tons)

(*The Mineral Industry.**)

	1900	1905	1910	1915	1916	1917
Aluminium	7,339	16,810	....	86,240	132,500	....
Asphalt	322,896	309,629	367,626	....	....	....
Coal	765,138,033	928,049,163	1,151,239,643	*1,308,800,000[1]	*1,345,207,000[1]	*1,369,800,000[1]
Copper	491,435	698,931	877,494	1,082,376	1,419,069	....
Lead	849,168	988,727	1,093,043	....	....	....
Petroleum[2]	149,132,116	215,361,296	327,615,603	429,119,688	*461,493,226	*500,651,086
Phosphate rock	2,795,149	3,845,552	5,594,856	*4,000,000[1]	*4,600,000[1]	....
Pig iron	39,599,457	54,034,783	66,210,694	64,515,927	....	....
Steel	28,727,239	43,900,648	58,656,312	....	....	....
Tin	*89,000	*95,200	*116,800	*126,800	*122,800	129,000
Zinc	479,128	653,565	824,973	....	....	....

[1] Approximate. [2] Barrels of 42 gal.

* Except figures marked *, which are estimates furnished by U. S. Geological Survey.

XVII. THE MINERAL INDUSTRIES

MINERAL PRODUCTION BY PRINCIPAL COUNTRIES, 1900–17

(In metric tons)

(*The Mineral Industry**)

	1900	1905	1910	1915	1916	1917
COAL						
Australasia	7,599,269	9,227,129	12,132,200	....	....	....
Austria-Hungary	39,107,786	41,952,008	47,943,109	52,679,712[1]	50,801,602[1]	*50,000,000[1]
Belgium	23,462,817	21,775,280	23,916,560	15,691,465[1]	19,900,000[1]	*15,000,000[1]
France	33,404,298	35,218,000	38,349,942	19,908,892[1]	22,000,000[1]	*30,800,000[1]
Germany	149,788,256	173,810,669	222,375,076	259,139,786[1]	*250,000,000	*240,000,000[1]
Japan	7,370,667	11,955,946	15,681,324	22,596,750[1]	22,189,969[1]	*28,000,000[1]
Russia	16,156,055	18,727,766	24,026,000	31,158,400[1]	128,962,724[1]	*20,000,000[1]
United Kingdom	228,772,886	239,906,999	268,676,528	283,570,560[1]	287,110,153[1]	*275,000,000[1]
United States	243,414,164	351,120,625	445,816,040	517,619,487[1]	597,474,000[1]	*625,000,000[1]
COPPER						
Africa	6,828	7,442	15,449	27,000	50,000[2]	*36,300[2]
Australasia	23,368	34,483	40,962	32,512	35,000[2]	....
Austria-Hungary	1,377	1,346	2,276	....	....	....
Bolivia	2,134	2,032	2,540	3,000	4,000[2]	....
Canada	8,595	21.595	23,810	47,202	53,263	*49,300[2]
Chile	26,016	29,126	38,346	52,081	71,430	*120,231
Cuba	....	....	3,538	8,836	9,311	....
Germany	20,635	22,492	25,105	35,000[2]	35,000[2]	....
Italy	2,797	2,997	3,272	940	1,000[2]	....
Japan	28,285	35,944	50,703	75,415	81,280	....
Mexico	22,473	65,449	62,504	30,969	55,169	....
Norway	3,998	6,406	10,592	32,410	35,000	....
Peru	8,353	12,213	27,375	16,000[2]	41,625	....
Russia	8,128	9,515	22,670	35,000[2]	16,000[2]	....
Spain-Portugal	53,718	45,527	51,080	....	....	....
Sweden	457	1,385	2,032	4,561	....	*590[2]
United States	274,933	397,069	492,720	646,212	880,750	*755,771
LEAD						
Australasia	87,100	106,418	105,897	....	....	....
Austria	10,650	12,968	15,476	....	....	....
Belgium	16,365	22,885	40,715	....	....	....
Canada	28,648	25,391	14,967	21,009	18,866	*14,552
France	15,210	24,100	20,226	....	....	....
Germany	121,513	152,590	159,851	....	....	....
Greece	16,396	13,729	16,710	11,595	....	....
Italy	23,673	19,097	14,495	21,812	....	....
Mexico	63,827	101,196	120,662	....	....	....
Spain	172,530	185,693	190,523	190,000[2]	....	....
United Kingdom	35,500	28,494	30,799	....	....	....
United States	253,204	290,472	353,186	487,177	540,892	*490,000
PETROLEUM[3]						
Dutch East Indies	2,253,355	7,849,896	11,030,620	12,386,808[4]	....	....
Galicia	2,346,505	5,765,317	12,673,688	4,158,899	*6,461,706	*5,965,447
India	1,078,264	4,137,098	6,137,990	6,833,333	*8,491,137	*8,500,000
Rumania	1,628,535	4,420,987	9,723,806	13,229,913	*10,298,208	*2,681,870
Russia	75,779,417	54,960,270	70,336,574	68,548,062	*72,801,110	*69,000,000
United States	63,620,529	134,717,580	209,557,248	281,104,104	*300,767,158	*335,315,601
PIG IRON						
Austria-Hungary	1,311,949	1,372,300	2,010,000	1,960,000	....	....
Belgium	1,018,561	1,310,290	1,852,090	....	....	....
Canada	87,594	475,491	726,471	828,920	1,060,787	....
France	2,714,298	3,077,000	4,032,459	4,750,000	....	....
Germany	8,520,540	10,987,623	14,793,325	11,790,199	....	....
Italy	23,990	31,300	215,000	377,510	454,923	....
Russia	2,933,786	2,125,000	3,042,046	3,696,560	....	....
Spain	91,126	383,100	367,000	419,000	....	....
Sweden	526,868	531,200	604,300	767,600	....	....
United Kingdom	9,003,046	9,746,221	10,380,723	8,793,659	9,047,983	....
United States	14,009,870	23,340,258	27,636,687	30,414,816	40,092,043	*39,243,241

[1] Short tons. [2] Estimated. [3] Barrels of 42 gal. [4] Includes British Borneo.

* Except figures marked *, which are estimates furnished by the U. S. Geological Survev.

MINERAL PRODUCTION BY PRINCIPAL COUNTRIES, 1900–17—*Continued*

	1900	1905	1910	1915	1916	1917
STEEL						
Austria-Hungary	1,145,654	1,188,000	2,188,371	2,686,226	....	....
Belgium	655,199	1,023,500	1,449,500	....	....	....
Canada	23,954	403,449	835,478	918,926	1,319,187	....
France	1,565,164	2,210,284	3,506,497	....	....	....
Germany	6,645,869	10,066,553	13,698,638	13,237,646	....	....
Italy	115,887	117,300	635,000	....	....	....
Russia	2,217,752	2,208,000	3,479,000	4,018,000	....	....
Spain	144,355	264,970	316,301	....	....	....
Sweden	300,536	340,000	468,600	588,800	....	....
United Kingdom	5,130,800	5,812,282	6,374,481	8,687,670	9,396,292	....
United States	10,382,069	20,354,291	26,512,437	32,686,887	43,486,574	....
ZINC						
Austria	6,742	9,204	13,305	....	....	....
Belgium	119,315	142,555	181,745	....	....	....
France	36,305	43,200	51,527	....	....	....
Germany	155,799	198,208	227,754	....	....	....
Holland	6,845	13,550	20,975	....	....	....
Russia	5,963	7,520	8,128	....	....	....
United Kingdom	30,207	50,125	63,587	....	....	....
United States	111,794	183,014	251,348	*415,726	*511,298	*530,505

WORLD'S PRODUCTION AND COINAGE OF PRECIOUS METALS, 1851–1917

(*Report of the Director of the Mint*)

PERIOD	GOLD		SILVER		Commercial Ratio of Silver to Gold
	Fine Ounces	Value	Fine Ounces	Coining Value	
PRODUCTION:					
1851–1855 (average)	6,410,324	$132,513,000	28,488,597	$36,824,000	15.41
1856–1860 (average)	6,486,262	134,083,000	29,095,428	37,618,000	15.30
1861–1865 (average)	5,949,582	122,989,000	35,401,972	45,772,000	15.40
1866–1870 (average)	6,270,086	129,614,000	43,051,583	55,663,000	15.55
1871–1875 (average)	5,591,014	115,577,000	63,317,014	81,864,000	15.98
1876–1880 (average)	5,543,110	114,586,000	78,775,602	101,851,000	17.86
1881–1885 (average)	4,794,755	99,116,000	92,003,944	118,955,000	18.62
1886–1890 (average)	5,461,282	112,895,000	108,911,431	140,815,000	21.14
1891–1895 (average)	7,882,565	162,947,000	157,581,331	203,742,000	27.06
1896–1900 (average)	12,446,939	257,301,100	165,693,304	214,229,700	33.50
1901–1905 (average)	15,606,730	322,619,820	167,995,408	217,206,180	36.30
1906	19,471,080	402,503,000	165,054,497	213,403,800	30.54
1907	19,977,260	412,966,600	184,206,984	238,166,600	31.24
1908	21,422,244	442,476,900	203,131,404	262,634,500	38.64
1909	21,965,111	454,059,100	212,149,023	274,293,700	39.74
1910	22,022,180	455,239,100	221,715,763	286,662,700	38.22
1911	22,348,313	461,939,700	226,192,923	292,451,500	38.33
1912	22,549,335	466,136,100	224,310,654	261,402,300	33.62
1913	22,249,596	459,941,100	223,907,843	135,246,400	34.19
1914	22,039,598	455,676,600	211,103,377	116,719,200	37.49
1915	22,758,808	470,466,214	179,753,978	93,227,934	39.84
1916	21,970,788	454,176,500	161,177,900	208,391,628	30.11
1917	20,491,176	423,590,200	163,992,700	212,030,965	23.09
COINAGE:					
1873–1880 (average)	8,665,153	179,124,608	91,460,904	118,252,482	....
1881–1890 (average)	5,898,643	121,935,781	97,881,838	126,554,296	....
1891–1900 (average)	13,707,461	283,358,375	116,010,359	149,993,192	....
1901–1905 (average)	13,645,423	282,075,960	137,801,324	178,852,964	....
1906	17,721,058	366,326,788	120,339,501	155,590,466	....
1907	19,921,014	411,803,902	171,561,490	221,816,867	....
1908	15,828,573	327,205,649	151,352,824	195,688,499	....
1909	15,153,116	313,242,714	87,728,951	113,427,331	....
1910	22,004,542	454,951,834	78,786,842	108,934,541	....
1911	18,002,444	372,143,555	117,237,838	148,156,282	....
1912	17,447,478	360,671,382	161,763,415	171,293,019	....
1913	15,494,784	320,305,619	155,497,316	155,265,702	....
1914	5,081,928	248,585,071	192,501,238	106,476,285	....
1915	....	183,518,602	194,017,162	100,679,385	....

XVII. THE MINERAL INDUSTRIES

MINERAL PRODUCTION OF THE UNITED STATES, 1900–17

(United States Geological Survey)

	1900	1905	1910	1915	1916	1917
METALS:						
Iron ore......long tons	....	42,526,133	56,889,734	55,493,100	77,870,553	75,573,207
Iron, pig.....long tons	13,789,242	22,992,380	27,303,567	30,384,486	39,126,324	38,612,546
Steel.........long tons	10,188,329	20,023,947	26,094,919	32,151,036	42,773,680	....
Silver......troy ounces	57,647,000	56,101,600	57,137,900	74,961,075	74,414,802	71,740,362
Gold.......troy ounces	3,829,897	4,265,742	4,657,018	4,887,604	4,479,056	4,051,440
Copper........pounds	606,117,166	888,784,267	1,080,159,509	1,388,009,527	1,927,850,548	1,886,120,721
Lead........short tons	270,824	302,000	372,227	507,026	552,228	540,000
Zinc........short tons	123,886	203,849	252,479	458,135	563,451	584,597
Quicksilver......flasks	28,317	30,451	20,601	21,033	29,932	35,954
Aluminum......pounds	[a]7,150,000	11,347,000	47,734,000	99,806,000	....	....
Antimonial lead...sh. t.	....	....	14,069	23,224	24,038	18,646
Platinum...troy ounces	400	318	773	8,665	28,088	38,831
NON-METALS						
Fuels:						
Bitum. coal [b]....sh. t.	212,316,112	315,062,785	417,111,142	442,624,426	502,519,682	551,790,563
Penn. anthracite...l. t.	51,221,353	69,339,152	75,433,246	79,459,876	78,195,083	88,939,117
Coke.......short tons	....	32,231,129	41,708,810	41,581,150	54,533,585	55,606,828
Petroleum.....barrels	63,620,529	134,717,580	209,557,248	281,104,104	300,767,158	335,315,601
Struct'l Materials:						
Cement.......barrels	17,231,150	40,102,308	77,785,141	87,685,222	95,394,433	91,342,930
Lime.......short tons	....	2,984,100	3,505,954	3,622,810	4,073,433	3,786,364
Sand & gravel...sh. t.	....	23,204,967	67,949,347	74,719,259	87,073,415	74,468,100
Abrasive Materials:						
Corundum and emery.......short tons	4,305	2,126	1,028	3,063	15,282	17,135
Garnet.....short tons	3,185	5,050	3,814	4,301	6,171	4,995
Pumice.....short tons	....	1,832	23,271	27,708	33,320	35,293
Chemical Materials:						
Arsenious oxide....lb.	....	1,507,386	2,994,000	10,996,000	11,972,000	12,302,000
Borax (crude)....sh. t.	25,837	46,334	42,357	67,003	103,525	108,875
Bromine......pounds	521,444	1,192,758	245,437	855,857	728,520	895,499
Fluorspar.....sh. tons	18,450	57,385	69,427	136,941	155,735	218,828
Gypsum....short tons	594,462	1,043,202	2,379,057	2,447,611	2,757,730	2,696,226
Phosphate rock....l. t.	1,491,216	1,947,190	2,654,988	1,835,667	1,982,385	2,584,287
Pyrite.......long tons	204,615	253,000	241,612	394,124	423,556	462,662
Sulphur.....long tons	3,525	181,677	255,534	....	....	....
Salt...........barrels	20,869,342	25,966,122	30,305,656	38,231,496	45,431,349	49,844,121
Pigments:						
Barytes.....short tons	67,680	48,235	42,975	108,547	221,952	206,888
Mineral paints...sh. t.	57,426	63,521	85,304	} 198,825	135,606	....
Zinc oxide.......sh. t.	48,840	68,603	58,481			
Miscellaneous:						
Asbestos....short tons	1,054	3,109	3,693	1,731	1,479	1,683
Asphalt.....short tons	54,389	115,267	260,080	740,254	786,811	782,713
Bauxite.....long tons	23,184	48,129	148.932	297,041	425,100	568,690
Chromic iron ore long tons	140	22	205	3,281	47,035	43,725
Feldspar....short tons	24,821	35,419	81,102	105,118	132,681	141,924
Fuller's earth....sh. t.	9,698	25,178	32,822	47,901	67,822	72,870
Glass sand.......sh. t.	....	1,060,334	1,461,089	1,884,044	2,018,317	1,942,675
Graphite....short tons	3,365	24,986	4,202	4,718	8,088	13,593
Magnesite...short tons	2,252	3,933	12,443	30,499	154,974	316,838
Manganese ore....l. t.	11,771	4,118	2,258	8,708	26,997	115,000
Manganiferous ore.l. t.	....	....	61,101	196,640	548,803	859,000
Mica.........pounds	11,450,283	3,176,875	10,606,190	8,471,821	9,731,863	8,134,533
Mineral waters gallons sold	45,276,995	46,544,361	62,030,125	52,113,503	55,928,461	46,784,419
Quartz.....short tons	32,495	51,145	63,577	112,575	88,514	142,673
Talc and soapstone short tons	27,943	40,134	79,006	98,677	119,725	144,177
Talc, fibrous.....sh. t.	63,500	56,500	71,710	88,214	93,236	74,671
Thorium minerals (monazite, and zircon........pounds	908,006	1,352,418	99,301	....	37,872	....
Tungsten ore....sh. t.	40	803	1,821	2,332	5,923	6,144

[a] Consumption. [b] Including brown coal and lignite, and anthracite mined elsewhere than in Pennsylvania.

XVII. THE MINERAL INDUSTRIES

VALUE OF MINERAL PRODUCTS OF THE UNITED STATES, 1900–17

(United States Geological Survey)

	1900	1905	1910	1915	1916	1917
METALS:						
Iron ore	$66,590,504	$75,165,604	$140,735,607	$101,288,984	$181,902,277	$238,260,444
Iron, pig (*a*)	259,944,000	382,450,000	412,162,486	401,409,604	663,478,118	1,053,785,975
Silver	35,741,100	34,221,976	30,854,500	37,397,300	48,953,000	59,078,100
Gold	79,171,000	88,180,700	96,269,100	101,035,700	92,590,300	83,750,700
Copper	98,494,039	137,761,561	137,180,257	242,902,000	474,288,000	514,911,000
Lead	23,561,688	28,690,000	32,755,976	47,660,000	76,207,000	99,000,000
Zinc	10,654,196	24,054,182	27,267,732	113,617,000	151,005,000	119,258,000
Quicksilver	1,302,586	1,103,120	958,153	1,826,912	3,768,139	3,786,675
Aluminum	1,920,000	3,246,300	8,955,700	16,280,000	33,900,000	45,882,000
Antimonial lead	....	....	1,338,090	3,665,736	4,483,582	3,781,560
Platinum	2,500	5,320	25,277	478,688	2,301,762	4,023,757
NON-METALS: (*a*)						
Fuels:						
Bituminous coal	220,930,313	334,658,294	469,281,719	502,037,688	665,116,077	1,249,272,837
Penna. anthracite	85,757,851	141,879,000	160,275,302	184,653,498	202,009,561	283,650,723
Coke	....	72,476,196	99,742,701	105,503,868	170,841,197	298,243,017
Petroleum	75,989,313	84,157,399	127,899,688	179,462,890	330,899,868	522,635,213
Natural gas	....	41,562,855	70,756,158	101,312,381	120,227,468	140,000,000
Structural Materials:						
Clay products	96,212,345	149,697,188	170,115,974	163,120,232	207,260,091	248,023,368
Cement	13,283,581	35,931,533	68,752,092	75,155,102	104,689,090	123,210,458
Lime	6,797,496	10,941,680	14,088,039	14,424,036	18,509,305	23,807,877
Sand and gravel	....	11,223,645	21,037,630	21,514,977	27,852,198	32,628,433
Stone	36,970,777	63,798,748	76,520,584	74,595,352	79,069,683	82,215,671
Abrasive Materials:						
Grindstones	710,026	777,606	796,294	648,479	766,140	1,147,784
Corundum and emery	102,715	61,464	15,077	31,131	123,901	241,050
Garnet	123,475	148,095	113,574	139,584	208,850	198,327
Pumice	....	5,540	94,943	63,185	82,263	84,814
Oilstones, etc	174,087	244,546	228,694	115,175	154,573	168,704
Chemical Materials:						
Arsenious oxide	....	32,210	52,305	302,116	555,187	1,118,313
Borax (crude)	1,018,251	1,019,154	1,201,842	1,677,099	2,409,459	3,609,632
Bromine	140,790	178,914	31,684	856,307	951,932	492,703
Fluorspar	94,500	362,488	430,196	764,475	922,654	2,287,722
Gypsum	1,627,203	3,029,227	6,523,029	6,596,893	7,959,032	10,495,343
Phosphate rock	5,359,248	6,763,403	10,917,000	5,413,449	5,896,993	7,771,084
Pyrite	749,991	938,492	977,978	1,674,933	1,965,702	2,485,435
Sulphur	88,100	3,706,560	4,605,112	....	....	....
Salt	6,944,603	6,095,922	7,900,344	11,747,686	13,645,947	19,940,442
Pigments:						
Barytes (crude)	188,089	148,803	121,746	381,032	1,011,232	1,171,184
Mineral paints	644,089	1,697,130	2,141,654	15,514,059	23,515,803	26,972,137
Zinc oxide	3,667,210	5,520,240	5,238,945			
Miscellaneous:						
Asbestos	16,310	42,975	68,357	76,952	448,214	506,056
Asphalt	415,958	758,153	3,080,670	5,242,073	7,102,132	8,470,615
Bauxite	89,676	240,292	716,258	1,514,834	2,296,400	3,119,058
Chromic iron ore	1,400	375	2,729	36,744	726,243	1,049,400
Feldspar	180,971	226,157	502,452	489,223	702,278	728,838
Fuller's earth	67,535	214,497	293,709	489,219	706,951	776,632
Glass sand	....	1,107,730	1,516,711	1,606,640	1,957,797	2,685,014
Graphite	197,579	318,211	335,443	429,631	935,471	1,167,879
Magnesite	19,333	15,221	74,658	274,491	1,393,693	2,899,818
Manganese ore	100,289	36,214	22,892	108,049	627,417	3,220,000
Manganiferous ore	....	....	186,765	822,216	2,005,491	5,154,000
Mica	147,960	178,588	337,097	428,769	594,391	806,782
Mineral waters	5,791,805	6,491,251	6,357,590	5,138,794	5,735,035	4,931,710
Quartz	86,351	104,109	193,757	273,553	242,786	318,069
Talc & soapstone	383,541	637,062	684,213	1,026,739	1,292,293	1,411,416
Talc, fibrous	499,500	445,000	728,180	864,843	961,510	881,462
Thorium minerals (monazite), and zircon	48,805	163,908	12,006	....	....	....
Tungsten ore	11,040	268,676	807,307	4,100,000	500,000	617,000

(*a*) "Spot" value, that is, value at the point of production.

XVII. THE MINERAL INDUSTRIES

MINERAL PRODUCTION BY STATES, 1900–17

(*United States Geological Survey*)

	1900	1905	1910	1915	1916	1917
METALS:						
COPPER (pounds):						
Alaska	....	4,900,866	4,311,026	70,695,286	113,823,064	84,759,086
Arizona	118,317,764	226,854,461	297,250,538	432,467,690	694,847,307	719,035,514
California	28,511,225	16,697,489	45,760,200	37,658,444	43,400,876	44,933,846
Colorado	7,826,949	9,404,830	9,307,497	7,272,178	9,536,193	10,054,951
Idaho	290,162	7,321,585	6,877,515	6,217,728	7,248,794	6,446,224
Michigan	145,461,498	230,287,992	221,462,984	238,956,410	269,794,531	268,508,091
Montana	270,738,489	314,750,620	283,078,516	268,263,040	352,139,768	276,225,977
Nevada	407,535	413,292	64,494,640	67,757,322	100,816,724	115,028,161
New Mexico	4,169,400	5,334,192	3,784,609	62,817,234	79,863,439	107,593,615
Tennessee	....	....	16,691,777	18,205,308	14,556,278	16,093,757
Utah	18,354,726	54,083,506	125,185,455	175,177,695	232,335,950	227,840,447
GOLD (fine ounces):						
Alaska	395,271	722,026	787,148	808,346	780,037	709,729
Arizona	202,856	130,192	165,113	220,392	197,989	250,613
California	765,109	928,660	988,854	1,090,731	1,063,302	1,012,461
Colorado	1,394,622	1,243,291	992,967	1,089,927	928,075	772,766
Idaho	83,433	52,032	50,113	56,628	51,195	36,511
Montana	227,266	236,520	179,974	240,825	209,386	177,690
Nevada	97,050	259,246	913,015	574,874	438,505	335,361
New Mexico	40,292	12,858	23,084	70,632	65,306	52,505
Oregon	81,980	60,222	32,960	90,321	91,985	81,624
South Dakota	298,842	334,460	260,266	358,145	361,444	356,662
Utah	192,155	248,691	208,627	189,045	186,679	170,383
Washington	34,743	17,899	38,992	22,330	28,087	23,617
IRON ORE (long tons):						
Alabama	2,759,247	3,782,831	4,801,275	5,309,354	6,747,901	7,037,707
Michigan	9,926,727	10,885,902	13,303,906	12,514,516	18,071,016	17,868,601
Minnesota	9,834,399	21,735,182	31,966,769	33,464,660	44,585,422	44,595,232
New Jersey	344,247	526,271	521,832	415,234	493,004	489,943
New York	441,485	1,139,937	1,287,209	998,845	1,342,507	1,304,317
Ohio	61,016	19,989	22,320	3,455	1,800	0
Pennsylvania	877,684	808,717	739,799	363,309	559,431	546,700
Tennessee	594,171	734,770	732,247	284,185	455,834	508,529
Virginia	*a*921,821	740,345	903,377	348,042	440,492	469,903
Wisconsin	746,105	859,283	1,149,551	1,095,388	1,304,518	1,202,235
IRON, PIG (long tons):						
Alabama	1,184,337	1,604,062	1,939,147	2,049,453	2,762,885	2,953,705
Illinois	1,363,383	2,034,483	2,675,646	2,447,220	3,922,512	3,483,096
New York	292,827	1,198,068	1,938,407	*c*2,104,780	*c*2,352,535	*c*2,417,527
Ohio	2,470,911	4,586,110	5,752,112	6,912,962	8,602,895	8,518,603
Pennsylvania	6,365,935	10,579,127	11,272,323	12,790,668	16,506,284	15,539,728
Tennessee	362,190	372,692	397,569	177,729	355,374	369,951
Virginia	490,617	510,210	444,976	251,346	399,885	520,311
LEAD (short tons):						
Colorado	82,137	56,638	38,542	32,352	33,046	29,327
Idaho	85,444	99,027	109,951	160,680	170,059	174,045
Missouri	....	*b*104,058	161,659	195,634	218,253	218,197
Utah	48,044	44,996	60,605	106,105	111,789	82,081
Wisconsin	....	....	3,909	2,632	3,121	2,930
SILVER (fine ounces):						
Arizona	2,995,500	2,605,700	2,655,700	5,665,672	6,680,252	6,962,257
California	941,400	1,082,000	1,791,600	1,689,924	1,936,910	2,107,107
Colorado	20,483,900	12,942,800	8,523,000	7,199,745	7,551,761	7,291,495
Idaho	6,429,100	8,125,600	7,027,000	13,042,466	11,570,399	11,402,542
Michigan	102,000	253,000	262,200	581,874	759,068	684,225
Montana	14,195,400	13,454,700	12,282,900	14,423,173	14,046,054	14,555,034
Nevada	1,358,700	5,863,500	12,366,000	14,453,085	13,682,067	11,217,654
New Mexico	434,300	354,900	779,000	2,337,064	1,729,917	1,535,807
South Dakota	536,200	179,000	120,600	197,569	210,100	190,382
Texas	477,400	417,200	364,400	724,580	664,319	587,945
Utah	9,267,600	10,319,800	10,445,900	13,073,471	13,545,802	13,360,905
Washington	224,500	119,400	204,900	213,877	294,516	266,112
ZINC (short tons): *d*						
Colorado	....	....	38,545	52,297	67,143	59,100
Kansas	....	....	13,229	14,365	12,448	20,249
Missouri	....	....	128,589	136,300	155,960	132,918
Montana	....	....	15,819	93,573	114,630	93,130
New Jersey	....	....	68,678	116,618	110,698	119,731
Utah	....	....	8,184	12,146	14,786	10,643
Wisconsin	....	....	25,927	41,403	56,803	59,742

a Includes production of West Virginia. *b* Includes production of entire Mississippi Valley. *c* Including New Jersey. *d* Recoverable zinc content of ore mined.

MINERAL PRODUCTION BY STATES, 1900-17—*Continued*

	1900	1905	1910	1915	1916	1917
NON-METALS:						
PORTLAND CEMENT (bbl.):						
California	44,565	1,225,429	5,805,098	4,503,306	5,332,860	5,653,362
Illinois	240,442	1,545,500	4,459,450	5,156,869	3,642,563	4,659,990
Indiana	30,000	3,127,042	7,219,199	8,145,401	10,050,433	8,705,831
Iowa	....	....	....	4,559,630	4,703,213	4,626,141
Kansas	80,000	230,686	5,655,808	3,580,287	4,212,010	4,015,169
Michigan	664,750	2,773,283	3,687,719	4,765,294	4,919,023	4,688,899
Missouri	....	3,879,542	4,455,589	4,626,771	5,178,021	5,882,240
New Jersey	1,169,212	3,654,777	4,184,698	1,579,173	2,609,617	2,449,876
New York	465,832	2,111,411	3,296,350	5,043,889	5,643,677	5,417,530
Pennsylvania	4,984,417	13,813,487	26,675,978	28,648,941	27,323,147	27,752,838
COAL (short tons):						
Alabama	8,394,275	11,866,069	16,111,462	14,927,937	18,086,197	20,068,074
Arkansas	1,447,945	1,934,673	1,905,958	1,652,106	1,994,915	2,143,579
Colorado	5,244,364	8,826,429	11,973,736	8,624,980	10,484,237	12,483,336
Illinois	25,767,981	38,434,363	45,900,246	58,829,576	66,195,336	86,199,387
Indiana	6,484,086	11,895,252	18,389,815	17,006,152	20,093,528	26,539,329
Iowa	5,202,939	6,798,609	7,928,120	7,614,143	7,260,800	8,965,830
Kansas	4,467,870	6,423,979	4,921,451	6,824,474	6,881,455	7,184,975
Kentucky	5,328,964	8,432,523	14,623,319	21,361,674	25,393,997	27,807,971
Maryland	4,024,688	5,108,539	5,217,125	4,180,477	4,460,046	4,745,924
Michigan	849,475	1,473,211	1,534,967	1,156,138	1,180,360	1,374,805
Missouri	3,540,103	3,983,378	2,982,433	3,811,593	4,742,146	5,670,549
Montana	1,661,775	1,643,832	2,920,970	2,789,755	3,632,527	4,226,689
New Mexico	1,299,299	1,649,933	3,508,321	3,817,940	3,793,011	4,000,527
Ohio	18,988,150	25,552,950	34,209,668	22,434,691	34,728,219	40,748,734
Oklahoma	1,922,298	2,924,427	2,646,226	3,693,580	3,608,011	4,386,844
Pennsylvania: Anth	57,367,915	77,659,850	84,485,236	88,995,061	87,578,493	99,611,811
Pennsylvania: Bitum	79,842,326	118,413,637	150,521,526	157,955,137	170,295,424	172,448,142
Tennessee	3,509,562	5,766,690	7,121,380	5,730,361	6,137,499	6,194,221
Texas	968,373	1,200,684	1,892,176	2,088,908	1,987,503	2,355,815
Utah	1,147,027	1,332,372	2,517,809	3,108,715	3,567,428	4,125,230
Virginia	2,393,754	4,275,271	6,507,997	8,122,596	9,707,474	10,087,091
Washington	2,474,093	2,864,926	3,911,899	2,429,095	3,038,588	4,009,902
West Virginia	22,647,207	37,791,580	61,671,019	77,184,069	86,460,127	86,441,667
Wyoming	4,014,602	5,602,021	7,533,088	6,554,028	7,910,647	8,575,619
COKE (short tons):						
Alabama	2,110,837	2,576,986	3,249,027	3,071,811	4,298,417	4,892,589
Colorado	*e*618,755	*e*1,378,824	*e*1,346,211	670,938	1,053,553	1,112,449
Illinois	....	10,307	1,514,504	1,686,998	2,320,400	2,289,833
New Mexico	44,774	89,638	401,646	389,411	502,812	577,679
Ohio	72,116	277,130	282,315	684,658	1,803,268	3,694,302
Pennsylvania	13,357,295	20,573,736	26,315,607	25,622,862	31,279,695	27,912,025
Tennessee	475,432	468,092	322,756	256,973	382,175	411,326
Virginia	685,156	1,499,481	1,493,655	629,807	1,242,322	1,304,230
West Virginia	2,358,499	3,400,593	3,803,850	1,391,446	2,521,309	3,349,761
NATURAL GAS (values):						
California	$79,083	$133,696	$476,697	$4,069,004	$5,440,277	....
Illinois	1,700	7,223	613,642	350,371	396,357	....
Indiana	7,254,539	3,094,134	1,473,403	695,380	503,373	....
Kansas	356,900	2,261,836	7,755,367	4,037,011	4,855,389	....
New York	335,367	623,251	1,678,720	2,335,252	2,524,115	....
Ohio	2,178,234	5,721,462	8,626,954	17,391,060	15,601,144	....
Oklahoma	....	130,137	3,490,704	9,195,804	11,983,774	....
Pennsylvania	10,215,412	19,197,336	21,057,211	21,139,605	24,344,324	....
West Virginia	2,959,032	10,075,804	23,816,553	36,424,263	47,603,396	....
PETROLEUM (bbls.):						
California	4,324,484	33,427,473	73,010,560	86,591,535	90,951,936	93,877,549
Colorado	317,385	376,238	239,794	208,475	197,235	121,231
Illinois	200	181,084	33,143,362	19,041,695	17,714,235	15,776,860
Indiana	4,874,392	10,964,247	2,159,725	875,758	769,036	759,432
Kansas	74,714	*c*12,013,495	1,128,668	2,823,487	8,738,077	36,536,125
Louisiana	....	8,910,416	6,841,395	18,191,539	15,248,138	11,392,201
New York	1,300,925	1,117,582	1,053,838	887,778	874,087	879,685
Ohio	22,362,730	16,346,660	9,916,370	7,825,326	7,744,511	7,750,540
Oklahoma	6,472	*d*	52,028,718	97,915,243	107,071,715	107,507,471
Pennsylvania	13,258,202	10,437,195	8,794,662	7,838,705	7,592,394	7,733,200
Texas	836,039	28,136,189	8,899,266	24,942,701	27,644,605	32,413,287
West Virginia	16,195,675	11,578,110	11,753,071	9,264,798	8,731,184	8,379,285

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c Includes production of Oklahoma. *d* Included with figures for Kansas. *e* Includes production of Utah.

IMPORTS AND EXPORTS OF MINERAL PRODUCTS, 1900–18

(*U. S. Statistical Abstract*)

(000 omitted)

	1900	1905	1910	1914	1915	1916	1917	1918
IMPORTS:								
Aluminum	....	....	....	$4,148	$2,999	$1,977	$602	$529
Antimony (ore and metal)	$341	$363	$551	696	1,420	8,039	3,221	4,434
Asbestos, unmanufactured	293	706	1,122	1,678	1,513	2,625	3,945	5,385
Manufactures of	15	53	269	391	230	170	68	40
Bismuth	225	305	316	....	....	....	196	....
Cement	....	1,276	602	160	132	9	20	37
Clays or earths	1,035	1,272	2,076	2,246	1,983	1,705	1,579	1,652
Coal	4,476	3,906	4,469	3,700	4,179	4,866	4,156	6,195
Coke	232	835	521	537	398	290	134	219
Copper: in ore, matte, etc.	3,032	4,892	9,272	13,696	11,228	22,851	32,576	33,091
In pigs, ingots, etc	12,457	19,942	30,938	40,809	20,432	52,927	93,703	89,222
Emery and other abrasives	201	309	473	....	....	....	1,760	2,441
Gold	44,573	53,648	43,339	66,538	171,568	494,009	977,176	124,413
Iron and Steel:								
Iron ore	1,497	1,670	6,763	6,984	3,823	4,618	3,991	3,116
Pig iron, including ferro-silicon	2,109	2,989	6,289	1,782	4,235	7,424	9,942	6,536
Scrap iron and steel	562	174	1,507	346	281	1,012	2,396	1,255
Manufactures of	17,806	20,346	33,213	26,550	18,222	13,957	15,683	17,280
Lead, ore and base bullion	3,128	3,616	3,643	1,987	2,574	3,358	5,043	10,818
Pig and manufactured	27	296	279	69	91	578	555	1,153
Manganese, ore and oxide of	2,693	1,661	1,592	1,841	1,494	5,358	10,546	11,945
Marble and manufactures of	812	1,308	1,552	1,335	894	729	659	422
Nickel ore and matte	1,070	1,205	3,618	6,109	5,074	9,520	9,971	9,120
Oils, mineral	220	494	610	13,665	9,790	12,512	17,840	21,826
Phosphates, crude	504	750	152	....	....	....	....	....
Plaster rock	242	361	426	....	....	....	385	256
Platinum	1,832	1,959	3,345	3,975	1,630	4,256	2,118	4,575
Salt	625	496	395	423	391	330	335	307
Silver	35,256	27,484	45,217	30,326	29,110	34,154	35,004	70,328
Sulphur ore	1,224	1,694	2,626	3,695	4,107	7,121	5,856	4,522
Talc	1	47	115	....	....	....	238	266
Tin	19,104	23,378	30,869	39,422	30,777	50,877	54,996	74,543
Zinc, ore	....	229	1,139	251	1,818	10,425	7,597	2,499
Manufactures of	171	60	870	364	272	523	191	60
EXPORTS:								
Aluminum and manufactures of	244	175	666	1,101	3,245	5,644	20,230	....
Asbestos and manufactures of	93	234	312	687	535	1,019	1,502	2,112
Asphaltum and manufactures of	121	291	702	1,493	1,016	1,341	1,267	1,037
Cement	163	1,484	2,292	3,382	3,241	3,777	4,112	5,989
Coal	19,502	29,158	40,512	59,921	55,906	65,958	83,119	111,825
Coke	1,233	2,228	3,077	2,789	2,304	3,779	6,280	10,155
Copper, ore and matte	1,009	1,338	1,304	3,257	220	....	....	....
Manufactures of	57,852	86,225	88,004	146,222	99,558	173,946	322,535	269,547
Emery and corundum	170	347	872	2,114	1,802	3,333	6,069	....
Gold	48,266	92,594	118,563	112,038	146,224	90,249	291,921	190,852
Graphite	21	43	302	656	520	892	1,458	1,048
Iron and Steel								
Iron ore	79	581	1,637	3,401	1,277	2,797	3,284	4,877
Pig iron	....	828	1,353	2,859	2,071	5,847	24,770	15,702
Scrap iron and steel	749	270	281	841	359	2,537	4,780	637
Manufactures of	118,039	133,630	177,497	247,779	247,774	601,057	1,133,746	1,125,889
Lead, manufactures of	205	499	481	2,610	9,045	13,823	16,560	19,108
Marble and Stone:								
Unmanufactured	120	227	413	676	443	364	459	594
Manufactures of	1,556	1,055	1,034	1,470	831	968	1,423	1,291
Nickel, nickel oxide and matte	1,219	3,196	4,532	9,403	11,110	9,876	12,271	7,681
Manufactures of	....	97	80	....	....	....	1,894	999
Oils, mineral	75,611	79,793	99,090	152,174	133,693	166,417	230,969	298,145
Phosphate rock	6,376	6,886	7,454	10,617	1,742	1,763	856	1,010
Plaster	....	16	6	283	189	187	142	150
Platinum	61	10	43	....	....	....	285	84
Quicksilver	556	653	256	32	155	274	1,071	679
Salt	55	190	286	542	616	601	727	1,417
Silver	56,712	48,848	55,286	54,965	50,942	59,792	78,280	139,181
Tin, scrap	44	29	64	....	....	....	....	....
Manufactures of	387	721	879	1,477	1,786	2,890	5,411	....
Zinc, ore and dross	1,205	1,765	881	588	695	177	888	2,249
Manufactures of	1,669	1,319	196	406	21,243	45,867	65,495	31,574

XVIII. MANUFACTURES

Story B. Ladd

General Conditions.—The year 1917 closed with the stimulation due to war activities at its maximum, and under the stress of Government requirements production continued at a high level for most of the year 1918. The pressure of war demands during the midyear increased rather than lessened and there was little of the customary seasonal halting in the leading industries. Summer shutdowns through lack of orders were virtually absent, and the straining for output led to the suspension of holiday observances in many plants. The labor problem presented its difficulties; not only were large numbers of men withdrawn from civil occupations by the draft, but some plants temporarily suspended by reason of difficulties between employers and workers (see also XV, *Labor*). Wage increases resulting as a rule from the settlement of these controversies added to costs of production with a narrowing of margins of profit. Although the upward swing in prices had not been definitely arrested, the movement to control prices was widening in its scope, leaving no important trade or industry that was not influenced directly or indirectly by Federal restrictions of one kind or another (see also XII, *The Conduct of Business*). The fixing of cotton-goods prices at levels substantially under those then prevailing tended to restrict operations and created doubts respecting commitments for the future. The urgent call for war supplies was so responded to that plates went forward at such a rate as to create a jam at some shipyards, and the bar-iron situation eased sufficiently by midyear to permit commercial orders to be taken for the next quarter delivery (see also XVII, *Iron and Steel*). Later in the year the favorable war news and the conclusion of the armistice had their effect on trade and the industrial pace began to slacken. The influenza epidemic also operated as a curb, particularly at shipyards, steel mills and coal mines, but governmental restrictions on non- or semi-essential industries improved the supply of labor for the more pressing work. (See also XII, *Economic Conditions.*)

Industrial Failures.—The industrial and mercantile failures for the first nine months of the year numbered but 7,573, as compared with 10,080 for the same period in 1917, a decrease of 24.8 per cent., and the liabilities were $107,459,964, as compared with $126,102,318, a decrease of 14.8 per cent. (see also XII, *Economic Conditions*). This record is the smallest in number for the period since 1907 and in liabilities since 1906. Only in the western states did the number of failures for the nine months of 1918 equal those of 1917. In New England there was a decrease of 13 per cent.; in the middle states, 30.6; northwestern, 26; southern, 48.9; and Far Western, 25.4 per cent. In manufactures the showing is equally favorable. The following statement gives the data of manufacturing failures by quarters for 1917 and the first three quarters of 1918:

	Number		Liabilities	
	1917	1918	1917	1918
1st quarter.	937	852	$20,082,297	$18,988,718
2d quarter.	951	726	20,358,611	16,105,251
3d quarter.	888	606	19,250,334	16,261,940
4th quarter	921	....	19,852,265	....
Total...	3,697		$79,543,507	

The failures returned for the first half of the year in comparison with the first half of 1917 and the same period of 1914 clearly disclose the very favorable industrial situation for the year. Defaults on the part of manufacturing establishments for the first six months numbered but 1,578, against 1,888 for the same period in 1917 and 2,113 in 1914, and the liabilities involved $35,093,969 for 1918 (first half-year), against $40,440,908 and $60,977,145 for 1917 and 1914, respectively, or on the basis of 1914 a decrease of 33.6 per cent. in 1917 and 42.5 per cent. in 1918. The following table gives the statistics for failures of manufacturers for the first half of the three years, distributed by industries:

INDUSTRY	Number			Liabilities		
	1914	1917	1918	1914	1917	1918
Woolens, carpets and knit goods	20	11	3	$560,045	$114,759	$32,909
Paints and oils	17	7	8	252,869	130,822	51,251
Iron, foundries and nails	33	21	17	1,663,211	582,779	170,315
Hats, gloves and furs	66	28	19	960,689	604,945	245,086
Chemicals and drugs	22	27	23	219,404	473,824	251,621
Cotton, lace and hosiery	23	20	18	923,118	789,123	255,581
Milling and bakers	116	190	117	1,394,260	1,289,632	933,800
Leather, shoes and harness	62	42	47	749,635	330,561	1,259,490
Printing and engraving	106	67	88	2,207,436	469,474	1,594,245
Glass, earthenware and brick	63	54	45	2,683,334	1,851,822	1,651,655
Clothing and millinery	355	263	194	3,511,825	2,763,225	2,200,203
Lumber, carpenters and coopers	235	274	179	13,387,762	8,799,427	3,799,160
Machinery and tools	118	97	96	5,816,474	2,577,364	3,824,211
Liquors and tobacco	45	50	41	1,041,010	834,917	4,255,440
All other	832	737	683	25,606,073	18,828,234	14,569,002
Total	2,113	1,888	1,578	$60,977,145	$40,440,908	$35,093,969

Development of Manufactures.—Abnormal activity in all lines to meet the requirements of military operations continued well through the year. The production of manufactures for the year 1917 has been estimated at more than $30,000,000,000, with exports for the fiscal year ending June 30, 1917, valued at $6,227,164,050, of which 78.23 per cent. were goods wholly or partly manufactured. For the fiscal year 1914, immediately preceding the war, the exports amounted to $2,329,684,025, of which 59.76 per cent. were goods wholly or partly manufactured. For the fiscal year ending June 30, 1918, the exports aggregated $5,847,159,678, six per cent. less than 1917, of which wholly or partially manufactured goods formed 77.79 per cent., approximately the same as 1917. High prices, of course, have helped to swell the figures. The average annual values deduced from the export figures give a line on the general advance. Thus the unit ton value of the exports of 240,961 tons of structural iron and steel in 1918 was $98.92, as compared with $67.49 (exports, 339,486 tons) in 1917 and $42.30 (exports, 296,282 tons) in 1914. In the case of flour, exports of 21,880,151 bbl. in 1918 show an average value of $11.19 per barrel in comparison with 11,942,778 bbl. at $7.80 in 1917 and 11,821,461 bbl. at $4.67 in 1914. Wheat exports in 1918 averaged in value $2.37 per bushel as compared with $1.99 in 1917 and $0.95 in 1914, and corn $1.84 per bushel in 1918, $1.12 in 1917 and $0.75 in 1914. These figures indicate relatively uniform ratios of increase in unit values for 1918 over pre-war conditions, namely, 134 per cent. for structural iron and steel, 139 per cent. for flour, 149 per cent. for wheat, and 145 per cent. for corn. (See also XII, *Economic Conditions;* and XIX, *External Commerce.*)

Basic Industries.—Owing to the large Government requirements, textile manufacturers have been unable to fill civilian orders in full and distribution has been made *pro rata.* The influenza epidemic cut down production seriously in New England. Manufacturers of men's furnishings have had difficulty in filling orders owing to labor conditions, likewise manufacturers of hosiery and knit goods. Piece-goods manufacturers complain of shortage of labor. Wool being under Government control, manufacturers were forced to use substitutes.

The textile industries from the standpoint of number of employees form the most important group of manufactures and they were among the first to be affected by the war. The iron and steel and affiliated industries, however, have probably been most extensively affected. The coming era involves a period of readjustment and one of reconstruction that will require steel in large quantities and the future use of steel will be extensive. The coming of peace brings cancellation of orders for munitions and strictly war materials which have kept the mills running at maximum capacity, but the demand for ship steel will continue at a high figure, as it is anticipated that it will take at least four years to replace the destroyed and lost tonnage and catch up with the natural growth of commerce. The Government will continue to be a large purchaser for the finishing of uncompleted projects and others contemplated for changes incident to a return to a peace basis; and in all lines of trade in which the Government has not been directly interested there has been an accumulation of orders.

Cotton.—Measured by the capital invested, number of persons employed and quantity and value of the products, cotton is by far the most important of the textile manufactures. Since the outbreak of the European War its importance has increased, as industrial changes have made it necessary to use 30 per cent. more cotton in the United States. The supply of cotton in the United States for the year ending July 31, 1918, amounted to 16,076,558 running bales, including 1,746,461 bales of linters, as compared with 16,606,048 bales in 1917, 16,972,895 bales in 1916, and 18,913,660 bales in 1915. Forty-eight per cent. of the total supply for 1918 was consumed in the United States.

Since 1914, when the price was the lowest recorded since 1898, the price of cotton has been rising rapidly. The following statement shows the quotations for middling upland in cents per pound on or about Oct. 12:

	New York	New Orleans	Liverpool
1918......	30.75	32.60	48.12
1917......	27.65	$26\frac{1}{4}$	39.44
1916......	17.55	$16\frac{1}{2}$	20.54
1915......	12.50	12	14.38
1914......	Nom.	$6\frac{11}{16}$	10.60
1913......	13.70	$13\frac{7}{16}$	15.22
1912......	11.00	$10\frac{3}{4}$	12.46
1911......	9.75	$9\frac{7}{16}$	10.82
1910......	14.75	$14\frac{5}{8}$	16.30
1909......	13.65	$13\frac{3}{8}$	14.52
1908......	9.20	$8\frac{15}{16}$	10.08
1907......	11.70	$11\frac{3}{8}$	13.08

The stock of cotton and linters on hand on Aug. 1 (3,890,105) was the highest recorded since 1915. Consumption proceeded at an unprecedented rate, being stimulated by the requirements for military purposes. These requirements, so far as they related to the manufacture of explosives and medicinal cotton, were met in a measure by an increased production of linters and of hull fiber. As was pointed out in the YEAR BOOK for 1917 (p. 495), linters now enter into many lines of manufacture that otherwise would use cotton, notably in the manufacture of explosives. This demand for linters has very materially increased the price of this product from a pre-war standpoint.

Although there has been a decided increase in the quantity of cotton ginned during recent years, there is a general tendency to construct larger and better equipped establishments and the number of ginneries has been decreasing; there were 20,351 ginning establishments for the crop of 1917, as compared with 21,624 for the crop of 1916.

Of the 7,685,329 bales of cotton, including linters, consumed in the United States, the major portion is used in the manufacture of fabrics (between 85 and 90 per cent. in 1917), the remainder being used in the manufacture of explosives, mattresses and medicinal cotton and for miscellaneous purposes. The spindle is the accepted unit of measurement for the consumption of cotton in the manufacture of fabrics. In 1918 the equipment of the cotton mills of the United States comprised 34,940,830 spindles, as compared with 34,221,252 in 1917 and 33,333,176 in 1916, an increase of 719,578, or 2.1 per cent. with respect to 1917 and 4.8 per cent. over 1916.

A certain percentage of the spindles are idle during each year; during 1918 there were 34,542,665 spindles in operation, and in 1917 there were 33,888,835, and in 1916, 32,805,883. The increase in the number of active spindles kept pace with the increase in the consumption of cotton.

Although the year as a whole was one of prosperity for the industry, the development was characterized by great irregularity. During the year there was a great demand for coarse yarn goods, and cotton was used to a great extent as an adulterant in combination with wool in the manufacture of clothing material. The steady payment of regular and extra dividends by many mills indicated the continued prosperity of the mills, following the period of uncertainty after the beginning of the war. The exports of manufactures of cotton for the fiscal year 1918 amounted to $169,398,420, as compared with $136,299,842 for 1917 and $112,053,235 for 1916.

Woolens and Worsteds.—The wool industry has been largely under Government control (see XVI, *Live Stock*). A census taken at the middle of the year gave consumption of wool in the grease for 1917 of 758,272,000 lb., as compared with 725,391,000 lb. in 1916 and 615,914,000 lb. in 1915, the figures for the scoured wool equivalent being 388,400,000 lb., 373,620,000 lb., and 317,318,000 lb., respectively. In 1914 the consumption of wool by the textile industries in condition purchased was 510,009,000 lb., the scoured equivalent being 313,982,000 lb. The imports of wool during the fiscal year ending June 30, 1918, amounted to 379,129,934 lb., slightly in excess of the imports of 1917 and 53 per cent. greater than 1914.

The production for the war period of the chief products is here given:

	1915	1916	1917
Worsted or mixed worsted goods, yards	220,140,558	271,141,884	271,592,072
Woolen or mixed goods, yards	207,975,155	234,580,366	257,001,862
Papermakers' felts, pounds	6,721,931	7,705,159	9,609,523
Carpets and rugs, yards:			
Tapestry Brussels	19,995,826	22,880,697	17,298,797
Axminster	19,011,582	20,120,069	16,140,217
Tapestry velvet	8,414,420	9,481,698	7,859,556
Wilton	7,299,774	8,491,436	6,570,755
Broad ingrain	3,055,516	3,488,905	3,435,500
Ingrain	3,492,222	3,516,126	2,978,693
Body Brussels	3,102,287	2,812,502	1,299,769
All other	3,828,869	4,705,519	4,357,889
Hosiery and knit goods:			
Cloth, pounds	9,366,640	10,891,649	11,550,829
Lining for rubber goods, pounds	2,787,427	2,984,058	3,052,985
Underwear, reported in pounds	5,130,483	5,849,064	7,366,646
Underwear, reported in dozens	2,373,112	2,441,201	2,531,724
Hosiery, dozens	4,585,229	3,792,220	3,979,221

The machinery equipment of the wool industry on July 1, 1918, comprised 6,296 sets of woolen cards, 2,278 worsted cards and 933 shoddy cards; 2,347 combs; 2,705,625 woolen spindles, 2,341,174 worsted spindles and 737,784 twisting spindles; 62,121 broad looms (50 in. or over reed space), 18,746 narrow looms (under 50 in.) and 10,502 carpet looms.

Silk.—The prosperity of 1916 in the silk industry extended through 1917 and 1918. The increased requirements for stocks were met by Japan, now the American silk manufacturers' chief source of supply. The imports of unmanufactured silk, amounting to 34,545,829 lb., valued at $100,930,025, for the fiscal year June 30, 1914, reached 43,282,366 lb., valued at $188,454,812, for 1918. Of these imports Japan contributed 80.7 per cent. in 1918 as compared with 78.8 per cent. in 1917 and 71.1 per cent. in 1914; China, 15.2 per cent. in 1918, 18.5 per cent. in 1917 and 16.5 per cent. in 1914; and all other countries, of which Italy and France are the chief, 4.1 per cent. in 1918, 2.7 per cent. in 1917 and 12.4 per cent. in 1914. A census of the silk situation as of June 1 developed stocks of raw silk in the country amounting to 11,863,177 lb.; thrown silk, 3,770,545 lb.; spun silk (including schappe), 1,638,641 lb.; and pierced cocoons, frisons, floss, noils and other waste, 7,592,600 lb.; a total of 24,864,963 lb. The stock of artificial silk on hand was 1,737,533 lb.

The following statement gives the consumption of silk in 1915, 1916, 1917 and 1918:

	1915	1916	1917	1918[1]
Raw silk	26,820,403	31,280,508	34,772,477	34,470,426
Spun silk (including schappe)	4,724,117	5,989,583	5,481,883	4,835,081
Pierced cocoons, frisons, floss, noils and other waste	5,088,581	6,034,965	6,884,148	12,030,333
Total silk	36,633,101	43,305,056	47,138,508	51,335,840
Artificial silk	4,683,543	4,645,607	5,619,730	5,801,221

[1] Consumption five months and estimated requirements seven months.

The machinery equipment of the mills on June 1, 1918, included 2,939,797 spindles, including winding, spinning and twisting, spun-silk and noil-yarn spindles; 70,130 cards; 105,087 looms, of which 62,591 are broad looms (over 40 in.), 26,425 narrow (40 in. and under), 3,963 velvet, and 12,108 ribbon; and 11,672 Jacquard machines (8,939 attached and 2,733 unattached). Of the spindles 6⅔ per cent. were idle, and of the looms, 19 per cent.

Jute.— Jute has been an important factor in the war programme. It enters into the manufacture of cordage and twine, carpets and rugs, although the heaviest consumption is for burlap and bagging. A census of the stock of jute and jute goods in the country as of June 1, 1918, showed 175,190,722 lb. of raw jute in the United States, 22,033,300 lb. on the high seas in transit to the United States, and 39,410,400 lb. owned abroad. The canvass developed holdings of over 108,000,000 lb. of bagging for covering cotton, and of burlap over 167,000,000 linear yds., with 245,000,000 yds. afloat or owned abroad. The figures for jute bags indicate 128,000,000 new jute bags ready for use in 1918, and the manufacturers estimated a production of over 210,000,000 bags from June 1 to the end of the year. Considering importations on the basis of the average for recent years, there are 353,000,000 jute bags available for all purposes. In 1917 the production of jute bags was 342,985,634.

The following tabular statement presents the statistics on consumption and production for 1917 and 1918:

	1917	1918[1]
CONSUMPTION		
Jute pounds	*232,475,670*	*233,261,000*
Raw jute	153,697,613	143,828,000
Jute butts and rejections	78,778,057	89,433,000
Burlap, yards	*621,691,204*	*642,101,000*
Under 10 oz.	367,547,665	374,135,000
10 oz. and over	254,143,539	267,966,000
PRODUCTION		
Bagging (for covering cotton), pounds	106,413,151	113,257,000
Burlap, yards	*211,347,799*	*245,669,000*
Under 10 oz.	130,334,000	146,107,000
10 oz. and over	81,013,799	99,562,000
Jute bags, number	*342,985,634*	*344,134,000*
Sugar bags	9,144,995	4,358,000
Other bags:		
Under 10-oz. burlap	176,129,607	183,624,000
10-oz. burlap and over	157,711,032	156,152,000

[1] Reported for five months, estimated for seven months.

The following shows the imports of jute and jute products for the fiscal years 1917 and 1918 in comparison with 1914:

IMPORTS	1914	1917	1918
Jute and jute butts, tons	106,033	112,695	78,312
Value	$11,174,028	$9,855,196	$7,213,641
Bagging (for covering cotton), sq. yards	14,514,993	3,498,774	1,772,717
Value	$996,601	$371,221	$212,593
Burlap, pounds	495,861,243	446,282,193	442,385,153
Value	$42,420,950	$48,296,400	$58,789,445
Jute bags	57,035,347	35,221,113	34,088,997
Value	$4,626,519	$2,983,241	$3,989,472

Dyestuffs and Coal-Tar Products.—Next to the supply of the raw fibers, the success of the textile industries depends upon the supply of dyestuffs. Of all the industries created or developed as a direct result of war conditions, none has shown more rapid progress than American dyestuffs. Prior to the war dependence on foreign countries for the needs of the color-using industries was practically absolute. Approximately 90 per cent. of the artificial colors used at that time was imported, and for the 10 per cent. produced in the United States the manufacturers were largely dependent on foreign crudes or intermediates. There were but five concerns making coal-tar colors. Since the outbreak of the war the number has increased, until in July, 1918, there were 190 establishments engaged in the manufacture of coal-tar products, including crudes, intermediates, dyes, lakes, medicinals, flavors, photographic chemicals, synthetic phenolic resins, and explosives.

The production in the fiscal year 1918 was as follows:

	Pounds	Value
Dyes	45,977,246	$57,796,228
Lakes	5,092,558	2,764,064
Photographic chemicals	263,068	602,281
Medicinals	2,418,274	5,639,867
Flavors	779,416	1,862,456
Perfume materials	19,545	125,961
Total	54,550,107	$68,790,857

The diversity of manufacture is shown by the fact that of the dyes naphthol green was made by six establishments; naphthol yellow, by three; direct yellow, by nine; direct orange, by two; tartrazine, by four; monazo dyes, by 33; diazo dyes, by 27; triazo dyes, by four; tetrakisazo and other azo dyes not identified, by 10; diphenylmethane, by one; triphenylmethane, by 20; diphenylnaphthyl methane, by two; xanthrones, by seven; acridines, by one; thio benzyl, by six; oxazine and thiazine, by 12; azines, by 19; sulphur coloring matter by 29; anthroquinone and related colors, by four; indigo and derivatives, by five; and unclassified dyes of unknown compositions, by four. Color lakes are made by 27; photographic coal-tar chemicals, by five; medicinals, by 32; flavors, by six; and perfume materials, by seven.

Our exports of dyestuffs in 1914 were valued at $356,919; in 1917 they amounted to $11,709,287 and in 1918 to $16,921,888. With the consumption of the last shipment of dyes from Germany, which reached the United States in April, 1915, the textile industry has depended upon domestic production.

Iron and Steel Industries.—The pig-iron production constitutes a gauge for the iron and steel industries. The output in 1917, 38,647,397 tons, was two per cent. less than 1916, the banner year, and for the first half of 1918 the production, 18,227,730 tons, was approximately 5.6 per cent. below that of 1917. The decrease was essentially in Bessemer and low-phosphorus pig. (See also XII, *Economic Conditions.*)

A census of the iron and steel industries covering 10,494 establishments, including dealers and jobbers, showed 8,589,000 net tons of iron and steel products on hand on Sept. 1, 1918, and consumption and requirements for the year aggregating 31,690,000 tons, of which 16,923,000 was on account of Government contracts.

The fixation of prices late in 1917 materially stabilized the industry, and there was not the heavy advances during the year that characterized 1917. Quotations of some of the leading products in November, 1918 and 1917, and October, 1917 and 1916, given in the table opposite, show the effect of price control.

The cancellation of war contracts at the close of the year has been a disturbing factor but, being to a considerable extent discounted, it created no violent disturbance. Commercial requirements, held in abeyance, are now to be met. The heavy machine-tool production during the war period may meet normal requirements for awhile, but builders of machinery classed as more or less non-essential will return to their regular lines with a depleted market to be restocked and with new foreign demands. The output of passenger automobiles was curtailed for the last half of the year 25 per cent. of that for the same period for 1917, subject to the condition that

PRICES OF IRON AND STEEL PRODUCTS

	1918	1917		1916
	November	November	October	October
Pig iron, Bessemer, ton	$36.60	$37.25	$37.25	$24.33
Pig iron, Basic, ton	36.90	33.75	33.95	20.83
Billets, ton	47.50	47.50	70.00	45.75
Sheet bars, ton	51.00	51.00	80.00	45.75
Forging billets, ton	60.00	60.00	[1]100.00	69.00
Wire rods, ton	57.00	57.00	85.00	55.00
Iron bars, cwt	3.50	3.50	4.50	2.35
Sheets, black #28, cwt	5.00	5.00	9.00	3.23
Sheets, galvanized #28, cwt	6.25	6.25	10.25	4.45
Wire nails, cwt	3.50	3.50	4.00	2.63
Coke, Connellsville, ton	6.00	6.00	6.00	3.38
Heavy steel scrap, ton	29.00	29.00	33.00	17.87
Rerolling rails, ton	34.00	35.00	40.00	18.75
Car wheels, ton	29.00	29.00	31.00	12.25

[1] September.

50 per cent. of the material was on hand on July 1.

The volume of current work is evidenced by the fact that on July 1, 75 companies had on hand orders for boilers with an aggregate of over 21,000,000 sq. ft. of heating surface, with an average monthly output of 3,108,000 sq. ft. There were orders for 1,527 turbines of 7,930,490 h. p. on the books of the manufacturers on June 1 for construction before the close of the year, comprising 875 of 4,818,200 h. p. for the Navy, 313 of 831,700 h. p. for the Emergency Fleet, and 339 of 2,280,590 h. p. for various land uses. During the five weeks ending Oct. 5 there were completed 518 locomotives. On that date there were orders on hand for 5,077, comprising 1,194 for the United States Railroad Administration, 621 for other United States railways, 2,972 for United States military railways in France, and 290 for the Allies.

Shipbuilding.—The expansion of the shipbuilding industry is illustrated by comparison of the number of established shipyards at the time of the organization of the United States Shipping Board with those actually available for merchant-ship construction 12 months later:

	Number of yards	Number of ways
May, 1918	115	750
May, 1917	59	262

There is shown an increase of 95 per cent. in number of yards and 186 per cent. in number of ways. The phenomenal growth is illustrated from another angle by the average number of employees, here shown by months:

MONTH	Total	Steel	Wood
1918—August	401,458	316,393	85,065
July	379,879	298,546	81,333
June	351,000	281,750	69,250
May	316,400	256,800	59,600
April	284,250	233,125	51,125
March	254,750	213,250	41,500
February	228,750	195,250	33,500
January	212,400	184,100	28,300
1917—December	172,250	149,750	22,500
November	133,900	116,000	17,900
October	111,000	98,000	13,000

For the period October, 1917, to September, 1918, the average number of employees was 258,731 (in steel yards, 212,997; wood yards, 45,734).

A special census of the shipbuilding industry was taken for the year 1916; the general statistics in connection with this census and the manufacturing census of 1914 are given in the table on page 542.

A comparison of the above data for wage earners shows the enormous expansion in shipbuilding—for steel, from an average of 28,142 in 1914 to 316,393 in August, 1918, and for wood, from 4,802 to 85,065.

Statistics for craft are equally illuminating. The following is a summary of the number and deadweight tonnage of the ships built and taken over by or constructed for the U. S. Shipping Board; for comparison the

THE SHIPBUILDING INDUSTRY, 1914 AND 1916

Class of Work	Year	Number of establishments	Wage earners (average)	Capital (000 omitted)	Wages (000 omitted)	Value of product (000 omitted)
Total	1916	1,137	72,497	$243,218	$60,576	$185,852
	1914	1,147	44,489	156,060	32,931	88,862
STEEL:						
New construction	1916	72	48,142	190,392	39,145	119,156
	1914	46	28,142	112,630	20,719	54,340
Repair only	1916	37	8,095	19,126	8,875	25,464
	1914	33	5,366	20,082	4,447	11,877
WOOD:						
New construction	1916	339	9,364	17,395	7,338	24,902
	1914	273	4,802	9,580	3,416	10,428
Repair only	1916	248	4,405	10,204	3,394	8,764
	1914	179	4,109	8,947	2,946	7,256
Boats (under 5 tons), masts, spars and rigging	1916	441	2,491	6,101	1,824	7,567
	1914	616	2,070	4,821	1,403	4,782

totals of delivered vessels for the country in 1916 and 1914 are given, these data including many small craft in the wood class:

	Steel		Wood and Composite	
	Number	Dead-weight Tonnage	Number	Dead-weight Tonnage
1918—September	45	260,950	27	96,000
August	41	236,045	22	78,500
July	37	212,405	5	18,000
June	42	252,585	5	18,000
May	42	255,541	1	3,500
April	30	162,805	....	....
March	20	162,200	....	....
February	16	124,650	....	....
January	11	91,441	....	....
1917—December	11	96,990	....	....
November	18	79,410	....	....
October	12	81,985	....	....
September	8	43,424	....	....
1916—Total	230	[1]483,860	1,147	[1]248,248
1914—Total	126	[1]242,959	987	[1]182,101

[1] Gross tons.

The total for the 12 months ending Sept. 30, 1918, is 385 ships of 2,231,007 deadweight tons. The speed acquired in ship construction has been one of the industrial triumphs of the year. The record is held by the *Grand Keys* of 3,350 tons, built by the Great Lakes Engineering Works (Ecorse, Mich.) in 34 days. The *Tuckahoe*, 4,900 tons, was built by the New York Shipbuilding Corporation in 37 calendar days; and of the larger ships, the *Defiance*, 12,000 tons, by the Bethlehem Shipbuilding Corporation in 46 days. Built tonnage per calendar day is a better measure of construction activity. The record is held by the Bethlehem Shipbuilding Corporation in the case of the *Defiance*, 260 tons, followed by the *Victories*, with 185 tons, and the New York Shipbuilding Corporation with the *Tuckahoe*, 185 tons. (See also XIX, *The Merchant Marine;* and XX, *Naval Architecture.*)

Aircraft Production.—The production of aircraft to meet the exigencies of the war has involved many activities other than the manufacture of airplanes, engines and their accessories. The aggregate of all aeronautical appropriations available for the Army for the fiscal year ending June 30, 1918, was $691,851,866.47, including the Act of July 24, 1917, $640,000,000, and other appropriations, $51,851,866.47. The operations charged against the same during the year amounted to $933,948,959.03. This included the operations of the Sales Department to the extent of $176,924,903.42, for which it was contemplated there would be reimbursements by resales, leaving for the estimated aeronautical operations of the Government for the fiscal year, $757,024,055.61. These were tabulated on estimated costs, and it was expected that the excess over the total aeronautical appropriations would be largely offset by saving on the estimated cost and by cancellation of orders. The estimated operations cover not only airplanes and engines but a variety of structures, equipment, training facilities and other essentials. The total estimated operations for all aeronautical purposes (exclusive of the Sales Department) for purposes other than airplanes and engines aggregated $282,113,349.06.

The estimated obligations for airplanes and engines and spare parts (including experimental and development work) charged to June 30, 1918, against the aeronautical appropriations for the fiscal year amounted to $474,910,706.55. This amount represents estimated obligations and not actual disbursements. Thus, as against the total estimated obligations for aeronautical purposes, aggregating $933,948,959.03, the disbursements reported to June 30 amounted to $430,234,316.99.

The actual payments for airplanes and engines and spare parts (including experimental and development work) amounted to $155,535,946.41. This includes not only payments for articles delivered or on account of work and materials, but advances to contractors in the nature of loans and payments made for the manufacture of planes and engines overseas. The payments for manufacture overseas amounted to $25,605,074.31, of which $16,600,000 was remittance to overseas disbursing officers for payments for the construction of airplanes and engines and $9,500,074.31 for the purchase of materials, supplies, etc., for shipment abroad to be used in overseas manufacture of airplanes and engines. Deducting the advances to contractors, payments for overseas manufacture and amounts paid on account of experimental and development work, the disbursements for airplanes, engines and their parts manufactured or in process of manufacture in the United States amounted to $106,741,490.77. The following tabular statement summarizes the disbursements for airplanes, engines and parts for the fiscal year ended June 30, 1918:

On account of production in United States	$106,741,490.77
Airplanes and parts	55,176,073.05
Under fixed-price contracts	33,976,690.87
Under cost-plus contracts	21,199,382.27
Engines and parts	51,565,417.72
Under fixed-price contracts	23,216,930.28
Under cost-plus contracts	28,348,487.44
Overseas manufacture	25,605,074.31
Advances to contractors	21,491,551.14
Experimental and development work	1,697,830.19
Total	$155,535,946.41

Of the amount charged to production in the United States, $106,741,490.77, airplanes and parts constitute 51.7 per cent. and engines and parts 48.3 per cent.; and of the total amount, 53.6 per cent. was payments under fixed-price contracts and 46.4 per cent. under cost-plus contracts.

The deliveries of airplanes and engines made prior to June 30, 1918, are given in the tabular statement on the following page, together with deliveries made subsequent thereto and prior to October 11, 1918, and the aggregate total.

An appropriation of $884,304,758 for the Air Service was made under the Act of June 9, 1918. Of this amount there was appropriated for Air Service production the sum of $760,000,000, of which $200,000,000 was set aside for airplanes, including spare parts, instruments and accessories; $250,000,000 for engines, parts, etc.; and $200,000,000 for foreign expenditures. The balance is made up of various items. The total disbursements for aeronautical purposes from June 30 to Sept. 30, 1918, amounted to $139,186,661.33, of which amount $135,515,953.67 was chargeable to appropriations prior to June 30, the balance being under appropriations after that date.

Labor conditions in connection with the industry were complicated by reason of the fact that the Government was largely competing with itself. For example, at one plant the labor

DELIVERIES OF AIRPLANES AND ENGINES

	Total	Fiscal year ending June 30, 1918	June 30 to Oct. 11, 1918
Airplanes	*9,781*	*6,147*	*3,634*
Training planes	7,324	5,618	1,706
Service planes (combat and bombing)	[1]2,457	529	1,928
Engines	*24,672*	*12,633*	*12,039*
For training planes	14,735	10,241	4,494
OX-5	8,006	5,474	2,532
A-7a (Hall-Scott)	2,250	2,188	62
Gnome 100 h. p.	278	209	69
LeRhone 80 h. p.	747	68	679
Hispano 150 h. p.	3,012	2,188	824
Lawrence	442	114	328
For service planes	9,937	2,392	7,545
Liberty (U. S.) 125 h. p.	9,689	2,390	7,299
Hispano 180 h. p.	242	......	242
Hispano 300 h. p.	5	2	3
Bugatti	1	....	1

[1] Not including Bristol Fighters condemned as unsafe in July, 1918.

turnover was from 400 to 600 per cent. a year, which means 40,000 to 60,000 men coming and going in order to maintain an organization of 10,000 to 11,000 men; in some departments there has been a complete change about fifteen times a year.

In contrast to the foregoing the statistics for the airplane industry for the census year 1914 shows the rapid growth. There were then 16 establishments engaged primarily in the manufacture of aircraft and parts, employing 168 wage earners (average number) and with a production for the year valued at $790,000. (See also XX, *Aeronautics* and *Mechanical Engineering.*)

Leather and Boots and Shoes.—The boot and shoe industry during the year has passed through a period of transition. This has been brought about by restrictions placed by the Government, shortage of skilled labor, and the high cost of prime materials. In consequence of these factors the factories have not been able to run to more than 69 per cent. of capacity. In spite of these handicaps, business has been unusually good, many factories having to turn down orders on account of inability to fulfill their contracts. The shoe factories in the eastern section of the country, particularly New England, have been busily engaged to a large extent in the manufacture of boots and shoes for the United States Army and Navy, the factories in Massachusetts securing at least 75 per cent. of the entire contracts awarded by the Government for this work. Owing to the scarcity of skilled labor in this industry, caused by many of the operatives being called to the colors, their places are being taken by women, and it is not an unusual sight to see women in American shoe factories operating welting and stitching machines, which heretofore was considered only man's work. This holds true in fact throughout many other departments.

Reports to the Bureau of Labor from 70 boot and shoe factories, employing 56,177 persons in June, 1917, show a decrease to 52,801 in June, 1918, or six per cent. in number, with an increase in pay roll of 13.3 per cent. and in average wage of 20.7 per cent. According to the *Monthly Labor Review,* the changes in the pay rolls of the principal establishments month by month from January, 1915, to May, 1918, show that the number of persons employed in May, 1916, and also in May, 1918, was 11 per cent. higher than in January, 1915, and the amount paid out to all employees for wages had increased 23 per cent. in May, 1916, and 105 per cent. in May, 1918, as compared with January, 1915. These figures indicate an increase in *per capita* earnings of 85 per cent. from January, 1915, to May, 1918. Increased wage rates, regularity in work, and application on the part of piece workers were the factors entering into this increase in earnings.

In the leather industry, reports from 34 manufacturers employing 15,268 persons in June, 1917, show a slight increase to 15,344 in June, 1918, with an increase in pay roll of 39.9 per cent. and in average wage of 39.2 per cent.

Certain restrictions were imposed by the War Industries Board under date of Sept. 30, 1918, in regard to shoe styles, leather, heels, etc., but with the termination of the war they have been withdrawn.

Dental Gold.—A census of the production of dental gold for 1917 was taken at the request of the Federal Reserve Board. There was reported by 66 establishments a production of 566,930 oz. of dental gold, valued ($20.67 per oz.) at $11,718,443. Of this 31,150 oz. was sold for export and 535,780 oz. to dental dealers and dentists (domestic). This absorption of gold in dentistry represents 14 per cent. of the gold product of the country for the year.

Glass.—Among the industries that have made remarkable progress in increased production, in export trade, and in the development of new products is the glass industry. The prewar trade was mainly domestic, the exports amounting to but $3,729,623 in 1914, whereas in 1917 they were $13,554,530, an increase of 263 per cent. Window-glass exports increased from $311,339 in 1914 to $3,483,596 in 1917; plate glass, from $35,767 to $2,223,329. New branches, hitherto not made in this country, are optical glass, chemical ware, gauge tubing, watch crystals, glazing glass used in polishing leather, oven glass (a heat-resisting glass), glass brick, siphon bottles, photographic glass and high-grade picture glass and glass for spectacles.

The output of plate glass in 1917 increased in quantity 18.3 per cent. and in value 79.9 per cent. over 1914; pressed ware and other articles made in pressed-ware establishments, 16.3 per cent. in quantity and 87.1 per cent. in value over 1914; machine-made bottles, 93.2 per cent. in quantity and 87.2 per cent. in value; lamp chimneys and allied articles, 87.7 per cent. in quantity and 163.4 per cent. in value; and lighting ware, 176.4 per cent. in quantity and 51.1 per cent. in value. Window glass, of which about 60 per cent. is now machine-made, totaled about 9,000,000 50-ft. boxes in the blast of 1916-17, as compared with 8,000,000 boxes in 1914. There were 400 glass factories in 1917 operated by 338 companies.

Buttons.—The elimination of European competition by reason of the war has led to the enlargement of existing button plants and the manufacture of buttons that were formerly imported. The fresh-water pearl button is primarily an American industry. Figures are not available for exports prior to July, 1917, but since then the monthly exports of fresh-water pearl buttons has amounted to over $45,000. The yearly consumption of fresh-water shells is estimated at about 50,000 tons, and for 1916 there were nearly 20,000 persons engaged in the fresh-water pearl-button industry, including fishermen and factory employees.

The ocean-pearl button industry is represented by about 112 establishments. The raw stock is chiefly imported, the importation of mother-of-pearl, unmanufactured, in 1916 amounting to $1,873,000, and the domestic production of ocean-pearl buttons was valued at $3,300,000. In 1917 the importation of mother-of-pearl was $2,238,000, an increase of nearly 20 per cent. over 1916. Vegetable-ivory buttons, made from the tagua nut, are produced by 23 factories and give employment directly and indirectly to over 10,000 people. The importation of tagua nuts in 1917 amounted to 51,699,719 lb., an increase of 50 per cent. over the high-record year, 1916. Prior to the war Hamburg was the center of the industry. Metal buttons are a large factor but the variety is great and it is difficult to estimate the present output or the number of persons employed. Celluloid buttons are the product of about 50 establishments, giving employment to about 5,000 persons; a production is claimed for 1917 amounting to at least $3,000,000, in comparison with an output in 1914 of $724,354.

Other classes of buttons are: agate, made of feldspar and clay, but not manufactured in this country, the trade being now largely supplied by Japan; bone buttons, with a production estimated at 300,000 great gross; composition buttons, made from shellac, papier-maché, rosin, other gums and pigments; papier-maché buttons, the manufacture of which has greatly increased since the war owing to the elimination of imports from Germany and Austria; crochet buttons, which before the war practically all came from Germany; glass buttons, prior to 1908 practically all imported from Austria but now well established on a commercial basis; horn buttons, the production of which in 1914 was valued at $299,487 and the output of which in 1916 exceeded that of 1914 by about 100 per cent.; rubber buttons, large quantities of which are used by the United States Navy; and wooden buttons.

PATENTS AND INVENTION

Walter F. Rogers

Patent Legislation.—The Act of Aug. 17, 1916, which, in view of the war, extended the time for filing applications and fees by citizens of countries conferring substantially similar privileges upon citizens of the United States, became ineffective for applications subsequent to Jan. 1, 1918. A bill (H. R. 8763) to renew the Act was passed by the Senate but did not pass the House because when presented for unanimous consent objection was made by one Representative, no one being present who could advise the House what foreign countries had provided for extensions of time on account of war conditions. The matter is being pressed in Congress and it is possible that the bill may yet be passed.

During the year Congress resorted to the extraordinary expedient of placing in the Naval Appropriation Act a provision referring all claims for infringement of any articles "used or manufactured by or for the United States" to the Court of Claims, thus permitting anyone under contract with the United States to manufacture any patented invention, limiting the patentee to a suit for "compensation" in the Court of Claims. In view of the probable delays in the Court of Claims with such an additional calendar, it has been proposed either to provide a commission to negotiate cases, when desired, or to enlarge the Court.

Licenses, etc.—Under the Trading with the Enemy Act of Oct. 6, 1917 (*A. Y. B.*, 1917, p. 501), a number of licenses have been granted by the Federal Trade Commission, as published in the *Official Gazette*, and the Alien Property Custodian has in a number of instances considered and determined the rights of aliens under patents. No authority has yet determined the rights of such patentees in cases of infringement.

Patentees and the Government.—The Procurement Division of the War Department and various other bureaus of the Government have been active in determining what patent applications should be withheld from publication during the war and the bases for war contracts involving patented inventions, there being a force of nearly 100 technical officers and employees engaged in this work. The just relation between the Government and its inventive employees seems gradually to have become better understood. At first the disposition was to regard property in ideas as negligible when effort was required to understand and measure the idea, though great contracts were made in some cases with the owners of inventions who were able to impress the value of their ideas upon officers of the Government. In some bureaus it has been proposed to conclude the matter by formal contracts with employees who are to license the Government to use the invention without other compensation than the salary that the employee would have received in any event. There was much discussion of the propriety and advisability of having patents issued to officers of the Government and then dedicated to the public. This has been done when the invention was made in the line of duty. The general rule in other cases has been to limit the interest of the public to a license in accordance with the maximum interest that the public would have when the invention was developed in Government time and at Government expense. In short, there has been a general realization, after consideration, that the essential purpose of the patent law is to encourage disclosure of inventions so that the public may have the benefit of such disclosure at the termination of the patent contract which grants the patentee the right to exclude others from making, using and selling the invention for a limited period.

The Patent Office.—The number of applications filed in the Patent Office for patents for inventions and for designs and for the registration of trade marks has shown a considerable decrease during the year, a decrease of approximately $300,000 in receipts and approximately 10,000 in the number of applications for patents for inventions and for designs, and 1,000 in applications for the registration of trade marks. There still remains in the Treasury nearly $11,000,000 to the credit of the Patent Office. During the year the Commissioner of Patents has amended the rule relating to attorneys, requiring them to submit for approval or disapproval all advertising, the purpose being to stop the offering of glittering inducements to the public to invent and the pursuit of practices calculated to bring discredit upon the patent system. This effort of the Commissioner has resulted in a prompt improvement in the ethical views of most of the offenders.

For the past two or three years an organization in the Patent Office formed to consider matters of interest to the Office and the patent system has done excellent work and is now publishing the *Journal of the Patent Office Society*, a review which promises to be useful both to the Society and to those having to deal with the Patent Office and interested in the patent system.

Invention and the War.—In view of the "censorship" upon the publication of applications for patents, it is not possible accurately to define the work of the inventors in supplying methods and devices to meet and overcome the ingenuity of the enemy. There have been offered to the Government, of course, thousands of absurd inventions, but, on the other hand, enough is known of what has been done to give assurance of great inventive progress in many arts, such, for example, as ordnance, detecting devices, telegraphy, telephony, airplanes, by-product coking, potash derivatives, ferro-alloys, oil engines, sulphuric and nitric acids, synthetic ammonia, utilization of natural dyes, the production of optical glass, etc. Unfortunately the public hears of the exploded "Garabed" perpetual motion machine and its congeries, but has not heard, except through the experts, of the long line of inventions that have helped to win the war and will provide new industries and new lines of work for the reconstruction period and after.

XIX. TRADE, TRANSPORTATION, AND COMMUNICATION

GROVER G. HUEBNER and ROBERT RIEGEL

MERCHANT MARINE

Tonnage Afloat.—No official figures of the merchant marine later than those to June 30, 1916, given in the last issue of the YEAR BOOK (pp. 503, 504) are available in the form given in previous issues of the YEAR BOOK, owing to war conditions. Data from the report of the Secretary of Commerce show the following tonnages on June 30, 1918:

June 30	Foreign Trade	Great Lakes	Seas and Rivers	Total
1916............	2,191,715	2,760,815	3,517,119	8,469,649
1917............	2,446,399	2,769,824	3,654,814	8,871,037
1918............	3,603,700	2,708,523	3,612,289	9,924,518

Figures are furnished, however, which give a summary of the vessels in which the U. S. Shipping Board is interested and which give some conception of the number of American vessels. The following table shows a classification of the vessels of 500 tons or over under some form of Shipping Board control on Sept. 1, 1918:

	Number	Gross Tons	Deadweight Tons
VESSELS OTHER THAN TANKERS:			
United States Vessels:			
Controlled by U.S. citizens or the Shipping Board..	1,593	4,493,612	5,397,688
Chartered to foreign Governments or citizens..	83	222,896	290,340
Foreign Vessels:			
Chartered to U.S. citizens or the Shipping Board.	579	1,315,623	1,505,614
Chartered to foreign Governments or citizens..	176	481,405	610,323
Total..................................	2,431	6,513,536	7,803,965
TANKERS:			
United States Vessels:			
Controlled by U. S.........................	128	687,105	1,019,800
Chartered to foreign Governments or citizens...	40	205,838	306,578
Foreign Vessels:			
Chartered to U. S. citizens or the Shipping Board	12	67,182	98,460
Chartered to foreign Governments or citizens...	7	37,540	53,910
Total..................................	187	997,665	1,478,748
Grand Total..................................	2,618	7,511,201	9,282,713

These figures indicate that on Sept. 1, 1918, there were 1,844 vessels flying the American flag of 500 gross tons or over, as compared with 3,134 registered vessels in 1916, many of which, however, were of insignificant size. Later figures indicate that on Nov. 1 the number of vessels of 500 gross tons or over flying the American flag had increased to 2,126, with a gross tonnage of 5,590,954, a net tonnage of 3,894,385, and a deadweight tonnage of 6,211,404. Of these, steam and gas vessels numbered 1,367, of 4,736,336 gross tons, and sailing vessels aggregated 759, with a gross tonnage of 779,593. Vessels of 1,000 gross tons or over totalled on this date 1,520, with a gross tonnage of 5,133,417.

The following table shows the ships owned by the U. S. Shipping Board on Nov. 27, 1918:

	No.	Deadwt. Tons	Gross Tons
New steamers....	469	2,531,120	1,712,489
Ex-German ships..	59	343,206	257,962
Ex-Austrian ships.	6	35,262	24,417
Other vessels.....	36	137,248	99,317
Total..........	570	3,046,836	2,094,185

The foreign vessels under charter to the Shipping Board on the same date numbered 333, with a gross tonnage of 1,394,243. Under proclamation of the President (see II, *International Relations*) 81 Dutch vessels were requisitioned, of a gross tonnage of 495,875. The following table shows the number and deadweight tonnage of steamers and sailing vessels, both foreign and American, under charter to U. S. citizens on Nov. 26, 1918, for use in various trades:

	American		Foreign	
	No.	Deadwt. Tons	No.	Deadwt. Tons
Coastwise......	87	137,237	66	134,700
West Indies and Cent. America	273	388,554	184	366,609
South America..	263	850,120	308	1,018,902
Trans-Pacific...	176	249,266	135	488,973
Trans-Atlantic..	104	533,954	181	677,149
Total........	903	2,159,131	874	2,686,333

Shipping in the Foreign Trade.—The customary table showing the value of goods imported and exported in American and foreign vessels is omitted for lack of official figures later than those to June 30, 1916, given in the last issue of the YEAR BOOK (p. 504). The following table shows the tonnage of vessels, of foreign and American registry, entering and clearing from American ports in the foreign trade of the United States since 1900:

Year	Total Net Tonnage	Foreign		American	
		Net Tonnage	Per cent.	Net Tonnage	Per Cent.
1900...............	56,444,146	44,099,576	78.0	12,344,570	22.0
1905...............	62,140,758	47,857,126	77.0	14,283,632	23.0
1910...............	79,941,664	62,244,602	78.0	17,697,062	22.0
1911...............	85,112,136	65,665,903	77.0	19,446,233	23.0
1912...............	92,574,983	69,614,418	75.0	22,960,565	25.0
1913...............	101,791,132	74,772,764	73.5	27,018,368	26.0
1914...............	106,571,986	79,101,283	74.2	27,470,703	25.8
1915...............	93,595,554	66,901,818	71.5	26,693,736	28.5
1916...............	103,972,905	68,143,162	65.5	35,824,742	34.5
1917...............	102,540,349	64,669,885	63.0	37,870,464	37.0
1918...............	91,525,419	52,980,156	57.9	38,545,263	42.1

The total net tonnage has decreased steadily during the war, declining 10.8 per cent. in 1918. During this war period the American vessel has greatly increased as a factor in carrying imports and exports, forming 42 per cent. of the total tonnage entered and cleared in 1918, as compared with only 28.5 per cent. in 1915. This has been due partly to a decline in the number of foreign vessels and partly to an increase in the absolute number of American vessels. The following table shows the tonnage entered and cleared during the fiscal years 1917 and 1918, by continents:

	Entrances		Clearances	
	1917	1918	1917	1918
Europe..........................	17,793,494	13,145,098	18,890,778	14,264,286
North America..................	27,318,484	27,131,029	27,701,854	27,237,121
South America..................	2,666,408	2,468,716	2,772,810	2,237,976
Asia............................	1,507,730	1,788,789	1,586,064	1,550,207
Oceania.........................	425,171	572,411	597,927	544,243
Africa..........................	751,992	349,894	527,637	235,649
Total....................	50,463,279	45,455,937	52,077 070	46,069,482

Undocumented Craft.—No reliable recent statistics of the undocumented vessels exist, the last count having been made in the 1906 census report, which showed 19,947 such vessels with a gross tonnage of 6,579,402 tons. Detailed figures from this report showing the situation in 1906 were given in the YEAR BOOK for 1910 (p. 523).

Tonnage Built.—The figures of 1916 had begun to reflect the increased activity in shipbuilding which began in 1915; during 1916 there were constructed 937 vessels of a total of 325,413 gross tons. The following table shows the number of vessels built and officially numbered since July, 1916, including vessels built for foreign owners:

	Year Ending June 30, 1917		Year Ending June 30, 1918		July-September, 1918	
	Number	Gross Tons	Number	Gross Tons	Number	Gross Tons
Seagoing:						
Steel	114	468,502	252	1,031,976	132	515,848
Wood	80	131,449	158	215,716	131	288,392
Total	194	599,951	410	1,247,692	263	804,240
Non-seagoing	1,352	212,708	1,990	183,101	277	30,010
Total	1,546	812,659	2,400	1,430,793	540	834,250

It is evident, therefore, that a very great increase has taken place in the shipbuilding industry during the past two years, and the increase has been particularly noticeable in respect to good-sized sea-going vessels. It is estimated that at the beginning of the war the American merchant marine included 2,750,000 deadweight tons of seagoing vessels of over 1,500 deadweight tons. On Sept. 1, 1918, there were 1,294 such vessels totalling 6,596,405 deadweight tons.[1] The following table shows the deliveries of seagoing vessels of over 2,500 deadweight tons during 1918 from American yards:

	Deadweight Tons
January	88,300
February	123,042
March	161,226
April	171,413
May	254,413
June	278,199
July	236,079
August	313,380
Total	1,626,052

The deliveries for the month of August exceed the previous world's record for any month, made by British shipyards in May, 1918. In the four pre-war years, 1913-16, this country built 107 seagoing vessels of over 1,500 deadweight tons each, totalling 805,037 deadweight tons. From August, 1917, to August, 1918, four times this tonnage was built and launched, or a total of 574 vessels of 3,017,238 deadweight tons. The number of shipyards in the United States in September, 1918, was 203, as compared with 61 in January, 1917; the number of shipways in September, 1918, was 1,020 as compared with 235 in 1917; the number of ship workers in yards building for the Emergency Fleet Corporation in 1918 was approximately 386,000 as compared with 50,000 in July, 1916. (See also XVIII, *Manufactures;* and XX, *Naval Architecture.*)

The following is a comparison of the construction programme of the Shipping Board on Nov. 15, 1917, and Sept. 1, 1918 (see also I, *War Organization*):

	Nov. 15, 1917		Sept. 1, 1918	
	Number	Deadweight Tons	Number	Deadweight Tons
Contract	800	4,500,000	2,291	13,514,212
Requisitioned	400	2,700,000	402	2,790,792
Total	1,200	7,200,000	2,693	16,305,004

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[1] This figure evidently includes more than the vessels engaged in foreign trade, from comparison with the report of the Secretary of Commerce (see "Tonnage Afloat," *supra*).

It is estimated that the losses of Allied and neutral vessels during the war were 21,404,913 deadweight tons, and that the tonnage constructed added to the enemy tonnage acquired totalled 18,042,825 deadweight tons, or a net loss of 3,362,088 deadweight tons. The normal increase during the war, judging by previous years, would have been 14,700,000 deadweight tons, so that the net deficit attributable to the war is 18,062,088 tons. The following table shows in detail the losses of American merchant vessels as a result of the war (see also XI, *The Navy*):

	Steam		Sail	
	Number	Gross Tons	Number	Gross Tons
Aug. 3, 1914 to April 5, 1917..........	16	60,312	3	6,831
April 6, 1917 to Nov. 11, 1918.........	69	236,745	57	50,561
Total........................	85	297,057	60	57,392
Torpedoed..................	51	216,345	..	......
Mined......................	6	17,791	1	1,904
Gunfire, etc................	28	62,921	59	55,488
Total..................	85	297,057	60	57,392

Ship Subsidies and Mail Payments.—The net cost of the foreign mail service for the fiscal year 1918 was $3,350,030, as compared with $3,264,821 in 1916 and $3,074,875 in 1915. The British colony of Trinidad has entered into a reciprocal domestic letter-rate agreement with the United States, and the arrangement made for handling the west coast of South America mail *via* the Isthmus of Panama is working satisfactorily. Parcel-post conventions were concluded with Portugal and the Society Islands, and negotiations are in progress with Chile, South Africa, Cuba, Paraguay, Spain, Switzerland and British India.

EXTERNAL COMMERCE OF THE UNITED STATES

Total Foreign Trade.—Official figures of the total value of imports and exports (including foreign exports) for the fiscal year ending June 30, 1918, show an interruption in the constant trade increase manifested in recent years. The total value for the fiscal year 1918 was $8,874,345,044, as compared with $8,949,403,579 in 1917,[1] and $6,531,366,395 in 1916, a decline in 1918 as compared with the preceding year of less than one per cent. The total value of our trade is still almost double that of the year 1915, though to a large extent this result must be attributed to rising prices. The decline of $75,058,535 in the value of our external commerce is entirely due to a reduction of the volume of exports, a gain being evident in imports. This is a striking reversal of previous tendencies, inasmuch as exports since 1914 have constantly formed an increasing proportion of our total trade. In 1918, however, they aggregated only 66.8 per cent. of the total, as compared with 70.3 per cent. in 1917. This change is illustrated by the following ratios of value of exports and imports to total foreign trade:

	Exports, per cent.	Imports, per cent.
1914...............	55.5	44.5
1915...............	62.3	37.7
1916...............	66.3	33.7
1917...............	70.3	29.7
1918...............	66.8	33.2

Exports to Foreign Countries.—The value of the total exports of the United States for the past three years has been: 1916, $4,333,482,885; 1917, $6,290,048,394; 1918, $5,928,285,641. Thus 1916 showed an enhancement in value of 56 per cent. over the preceding year, 1917 evidenced a gain of 45 per cent., and the year 1918 a loss of about six per cent., or $361,762,753.

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[1] These figures differ from the YEAR BOOK for 1917 by reason of revision.

The exports of the latter year were, nevertheless, double the value of those of 1915. The exports of foreign and domestic merchandise by continents for the last five fiscal years are given in the following table:

Continent	1914	1915	1916	1917[1]	1918
Europe	$1,486,498,729	$1,971,434,687	$2,999,305,097	$4,324,512,661	$3,738,231,162
North America	528,644,962	477,075,727	733,024,674	1,163,758,100	1,237,720,614
South America	124,539,909	99,323,957	180,175,374	259,480,371	314,564,482
Asia	113,425,616	114,470,493	278,610,881	380,249,708	447,456,515
Oceania	83,568,417	77,764,725	98,775,828	109,314,490	134,889,500
Africa	27,901,515	28,519,751	43,591,031	52,733,064	55,423,368
Total	$2,364,579,148	$2,768,589,340	$4,333,482,885	$6,290,048,394	$5,928,285,641

[1] These figures differ slightly from those given for 1917 in the YEAR BOOK for 1917 by reason of subsequent revision of the official figures.

It appears from this table that the year's decline in the export values is entirely attributable to a falling off in exports to Europe, although these in 1917 accounted for 67 per cent. of the increase over the preceding year. A very large part of this diminution was entailed by the necessary restrictions imposed by the operations of the War Trade Board, whose policy was fully outlined in the 1917 YEAR BOOK (p. 515), and whose work during the current year is described below. It is sufficient here to note that combined exports to Holland, Denmark, Finland, Norway and Sweden, all of which received increased supplies from us in 1917, aggregated only $45,559,715 in 1918 as compared with $293,081,858 the previous year. This accounts for over 60 per cent. of the total net decrease in exports to Europe. Likewise, the value of exports to Greece declined from $20,860,645 in 1917 to $2,573,882 in 1918.

The greater part of the development of exports to Europe in 1916 and 1917 was attributable to Great Britain, France and Italy. In 1918, while exports to Italy increased in value, those to Great Britain and France declined. In the fiscal year 1918 a tremendous decline was experienced in exports to European Russia, these dropping from $428,688,107 in 1917 to $116,705,346, a loss exceeding that of the Baltic countries combined, and more than equalling the $250,000,000 increase in exports to European Russia in 1917. On the other hand, exports to Belgium, Italy, Portugal, and the Balkan countries in 1918 showed an increase. Exports to all other continents were above their values in 1917, Oceania showing the largest relative increase (22 per cent.), and North America the greatest absolute increase ($73,962,514). South American trade continued the improvement of the preceding two years, increasing by over $55,000,000. The exports of merchandise to important foreign markets of the United States are shown in the following table covering the trade of the last four years:

Market	1915	1916	1917[1]	1918
Germany	$28,863,354	$288,899	....	....
Great Britain	911,794,954	1,526,685,102	$2,046,812,678	$1,994,894,260
France	369,397,170	628,851,988	1,011,667,206	890,481,513
Canada	300,686,812	468,784,793	787,177,099	778,509,792
Netherlands	143,267,019	97,476,328	109,082,168	11,188,021
Italy	184,819,688	269,246,105	360,608,356	477,530,702
Mexico	34,164,447	47,945,519	79,004,597	106,893,653
Belgium	20,662,315	21,848,114	37,367,997	91,238,638
Cuba	75,530,382	127,198,578	178,292,328	235,682,045
Argentina	32,549,606	66,378,366	82,375,165	109,444,001
Japan	41,517,780	74,470,931	130,427,061	267,730,637
Russia in Europe	....	178,694,800	428,688,107	116,705,346

[1] These figures differ slightly from those given for 1917 in the YEAR BOOK for 1917 by reason of subsequent revision of the official figures.

A comparison of the exports to the Entente Allies and their possessions and dependencies, to the Teutonic Allies and their possessions, and to neutral nations is given in the table below; these figures naturally differ from those in previous issues of the YEAR BOOK because of the change in status of many countries during the year. Nations are grouped according to their status at the close of European hostilities, colonies of the Teutonic Allies are included among the possessions of the Entente Allies, and many nations are included among the Entente Allies which severed diplomatic relations without formal declaration of war. The figures follow:

	1916	1917	1918
Entente allies	$3,829,794,388	$5,614,152,530	$5,415,843,846
Teutonic allies	477,370	2,366,964	305,557
Neutrals	528,342,586	673,528,900	468,655,615
Total	$4,333,482,885	$6,290,048,394	$5,928,285,641

The decline in the value of the exports to neutrals is accounted for in part by the change in status of numerous countries.

There has been in recent years a tendency toward a decline in the value of exported "crude foodstuffs and food animals" as compared with the value of total exports, and this was again apparent in 1918, this group forming only 6.4 per cent. of the total value, in comparison with 8.5 per cent. in 1917 and 8.9 per cent. in 1916. Its absolute value also decreased in 1918 by $156,324,069. "Foodstuffs partly or wholly manufactured," however, which declined greatly in relative value in 1917, increased both absolutely and relatively in importance in 1918, this group contributing 19.7 per cent. of the total value of exports. An absolute and relative increase was also shown in the groups of "crude materials for use in manufacturing," and "manufactures for further use in manufacturing." "Foodstuffs partly or wholly manufactured" underwent the greatest relative change, increasing in value over the preceding year by 56 per cent. This group was also responsible for the greatest absolute increase. "Manufactures ready for consumption" declined very greatly in

IMPORTS AND EXPORTS OF MERCHANDISE, BY CLASSES

YEAR ENDED JUNE 30	Foodstuffs in Crude Condition, and Food Animals	Foodstuffs Partly or Wholly Manufactured	Crude Materials for Use in Manufacturing	Manufactures for Further Use in Manufacturing	Manufactures Ready for Consumption	Miscellaneous	Total
IMPORTS:	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1900	97,916,293	133,027,374	276,241,152	134,222,045	203,126,341	5,407,979	849,941,184
1905	146,130,903	145,355,839	389,160,658	177,827,960	252,349,842	6,665,061	1,117,513,071
1910	144,776,636	181,566,572	566,270,770	285,138,373	367,723,367	11,471,712	1,556,947,430
1911	181,194,863	172,006,501	511,362,140	287,785,652	361,422,180	13,454,769	1,527,226,105
1912	230,358,230	196,100,608	555,986,041	293,739,134	360,018,963	17,061,958	1,653,264,934
1913	211,746,500	194,243,220	635,210,201	349,401,928	408,178,704	14,227,681	1,813,008,234
1914	247,947,621	227,644,329	632,865,860	319,275,488	449,318,214	16,874,145	1,893,925,657
1915	223,929,564	285,725,091	575,357,144	237,176,522	335,876,628	16,104,791	1,674,169,740
1916	251,886,746	310,938,181	948,825,500	356,857,137	311,870,962	17,504,984	2,197,883,510
1917	335,573,042	343,435,475	1,109,704,565	477,730,509	377,256,553	15,655,041	2,659,355,185
1918	372,681,751	380,338,011	1,227,283,280	552,058,236	394,671,791	19,026,334	2,946,059,403
EXPORTS[1]							
1900	227,347,193	318,126,502	325,589,000	152,890,591	331,955,684	14,854,601	1,370,763,571
1905	118,185,098	283,065,098	472,114,493	209,926,174	402,049,798	6,403,980	1,491,744,641
1910	109,828,320	259,259,654	565,934,957	267,765,916	499,215,329	8,079,822	1,710,083,998
1911	103,401,553	282,016,883	713,018,206	309,151,989	598,367,852	7,592,542	2,013,549,025
1912	99,899,270	318,838,493	723,008,839	348,149,524	672,268,163	8,155,539	2,170,319,828
1913	181,907,266	321,204,373	731,758,513	408,806,949	776,297,360	8,531,897	2,428,506,358
1914	137,495,121	293,218,336	792,716,109	374,224,210	724,908,000	7,122,249	2,329,684,025
1915	507,003,179	454,565,404	510,455,540	355,862,329	807,465,511	80,826,502	2,716,178,465
1916	380,638,102	599,059,151	535,952,043	657,923,305	1,998,298,249	100,306,729	4,272,177,579
1917	531,866,009	737,795,334	731,990,339	1,191,262,523	2,942,577,415	91,672,430	6,227,164,050
1918	375,541,940	1,153,448,051	897,328,794	1,203,916,333	2,191,137,089	25,787,471	5,847,159,678

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[1] Exports of domestic merchandise only.

relative and absolute importance, although the value of this group had been constantly increasing from 1915 to the present time. The total value of the exports of domestic merchandise since 1900 by groups of articles is shown in the table on the preceding page.

An examination of the following table of exports classified by uses shows that foodstuffs increased greatly in value, while munitions and materials for munitions dropped back to approximately their values in 1916. This is largely because after the assumption of belligerent status by the United States such munitions were largely removed from normal exportation, and materials were increasingly needed at home. War supplies and leather manufactures also decreased in value. Forage and textile manufactures, however, showed substantial increases. But the greatest gain was reflected in foodstuffs. Since 1915 the value of exported foodstuffs has increased from $904,098,619 to $1,442,864,898, or 60 per cent. The following table shows the figures relating to the principal war products:

	1916	1917	1918
Foodstuffs[1]	$931,711,463	$1,214,626,362	$1,442,864,898
Munitions[2]	481,490,760	894,771,303	423,069,556
Materials for munitions[3]	368,151,707	753,219,444	424,318,292
War supplies[4]	382,760,396	410,890,446	407,204,724
Hides, leather and manufactures thereof[5]	124,604,413	124,507,853	78,508,776
Forage[6]	67,171,785	77,001,828	88,016,228
Textile manufactures	166,036,890	154,723,398	187,147,841
Total	$2,521,933,464	$3,629,740,634	$3,051,130,315

[1] Includes total foodstuffs except oats.

[2] Includes firearms and explosives, except dynamite.

[3] Includes zinc and zinc manufactures, lead and lead manufactures, brass and brass manufactures, iron rods, steel billets, metal-working machinery and sulphuric acid.

[4] Includes horses, mules, harness and saddles, aeroplanes, commercial automobiles, automobile tires, wagons, barbed wire, horseshoes, mineral oils and surgical apparatus.

[5] Includes hides, sole leather, uppers, other leather, men's shoes and other manufactured leather.

[6] Includes cotton manufactures and woolen manufactures.

As was shown by the general figures preceding, exports during 1918 were abnormally great in value but showed no increase. As regards particular commodities a mixture of forces affected the results of the past fiscal year. In the first place, there were certain products, such as foodstuffs, the continued exportation of which was absolutely necessary, and these of course showed increases, although not large. Second, there were products which might naturally be expected to expand in volume and value but which became so necessary to the programme of war manufacturing at home that a smaller surplus was available for export than in the preceding year. Third, there were certain products the exportation of which was arbitrarily limited in order to give precedence to other materials more urgently needed. These tendencies are illustrated by the table of prominent export commodities given on the following page (see also XVI, *Statistics of Agriculture;* and XVII, *Statistics of Mineral Production*).

In addition to merchandise, gold was exported to the value of $190,852,224, as compared with $291,921,225 in 1917, and silver to the value of $139,181,399, as compared with $78,279,931 in 1917. (See also XII, *Economic Conditions;* and XIII, *Banking and Currency.*)

As was true in 1917, a large portion of the increase of export values is to be attributed to the large price increases which accompany a war period. Examination of the monthly export prices furnished by the official figures shows that of the prices for 75 articles, only four articles showed a decrease in price in 1917 and only 11 in 1918. These decreases were almost infinitesimal in most cases, while the majority of articles advanced substantially in value. This is also demonstrated by the index numbers given elsewhere in this issue of the YEAR

EXPORTS OF PRINCIPAL COMMODITIES

	1914	1916	1917	1918
Brass and manufactures of......	$7,472,476	$164,876,044	$383,327,550	$61,443,993
Breadstuffs....................	165,302,385	435,679,323	588,983,454	633,309,485
Cars and carriages.............	51,676,222	167,743,843	166,543,664	156,774,448
Cotton (unmanufactured).......	610,475,301	374,186,247	543,074,690	665,024,655
Cotton manufactures...........	51,467,233	112,053,235	136,299,842	169,398,420
Explosives....................	6,272,197	467,081,928	802,789,437	378,901,793
Leather and tanned skins and manufactures...............	57,466,261	146,703,815	153,709,573	100,920,272
Oil cake, etc..................	21,667,672	28,561,303	31,221,749	4,994,193
Spirits, wines and malt liquors...	4,134,420	12,577,611	20,883,227	8,839,118
Tobacco manufactures..........	7,489,811	6,944,347	15,534,438	21,713,541
Vegetables....................	6,936,400	15,952,412	22,290,710	26,972,711
Wool manufactures.............	4,790,087	53,983,655	18,423,556	17,749,421
Zinc and manufactures of.......	406,208	45,867,156	65,494,894	31,573,770
Agricultural implements.........	31,965,789	17,611,297	26,552,986	35,076,911
Fertilizers....................	11,978,738	5,343,497	6,980,132	5,840,139
Furs and fur skins.............	14,969,371	9,288,786	15,729,160	13,903,631
Naval stores..................	19,882,165	13,503,607	15,581,208	11,172,234
Tobacco, unmanufactured.......	53,963,670	53,365,195	59,954,307	69,699,725
Wood, and manufactures of.....	103,179,640	60,661,774	62,820,257	82,054,086
Chemicals, drugs, dyes..........	27,079,092	124,478,474	187,890,822	181,726,498
Coal, hard and soft............	59,921,013	65,955,709	83,135,141	111,825,165
Copper and manufactures.......	146,222,556	173,946,226	322,535,344	269,546,619
Fruits and nuts................	31,850,392	36,965,228	39,138,817	34,480,678
India-rubber manufactures......	12,441,220	35,153,374	31,105,075	33,343,181
Iron and steel and manufactures.	251,480,677	621,237,972	1,133,746,188	1,125,889,371
Oils, mineral..................	152,174,056	166,416,922	230,968,940	298,144,927
Oils, vegetable................	16,251,486	27,165,026	26,280,134	25,020,890
Paper and manufactures thereof..	20,663,634	29,107,386	43,152,980	50,357,686
Meat products.................	143,261,846	266,642,108	353,812,806	593,940,545

Book (see XII, *Economic Conditions;* and XV, *Labor*).

Exports by Groups of Ports.—Official statistics show the following exports from the various groups of customs districts of the United States for the fiscal year ending June 30, 1918:

	1917[1]	1918
Atlantic Coast....	4,395,502,570	3,889,764,707
Gulf Coast.......	685,315,838	715,677,577
Mexican Border...	33,139,215	51,052,480
Pacific Coast.....	333,955,377	491,595,858
Northern Border..	842,135,394	780,195,019
Interior Ports.....	....	....
Total..........	6,290,048,394	5,928,285,641

The falling off in European exports explains the decline that is evident on the Atlantic Coast. Other ports show substantial increases. The Gulf ports, which were stationary in 1917, showed progress in 1918, though the increase was only $30,000,000, as compared with a gain of $200,000,000 in 1916. The greatest proportionate gain in exports was on the Mexican border.

The following table shows some of the important ports in the United States as regards exports:

	1917	1918
New York........	3,053,119,504	2,616,850,680
Philadelphia......	464,471,031	446,612,168
New Orleans......	303,510,401	381,428,110
Baltimore........	374,033,121	336,356,608
Detroit..........	290,375,971	263,875,029
Seattle...........	177,650,134	258,005,365
San Francisco....	142,890,207	211,874,817
Boston...........	225,578,485	205,189,419
Buffalo..........	217,120,263	189,022,114
Galveston........	266,279,258	181,770,437
All customs districts........	6,290,048,394	5,928,285,641

Exports to American Dependencies.—Exports to non-contiguous territories of the United States in 1918 were valued at $195,715,471, as compared with $160,480,945 in 1917 and $116,123,797 in 1916. The greater portion of this gain was attributable to the trade with the Philippines, which increased by 77 per cent. Porto Rico and Alaska increased 18 and 15 per cent., respectively, while slight declines were evident for Hawaii and Guam. The combined exports to the territories now exceed in importance the value of exports to any one of the following foreign markets: Spain, Sweden, Portugal, Norway, Netherlands, Switzerland, Central American states, British West Indies, or Mexico; while Hawaii is superior as a market to the British West Indies, Peru, Uruguay, Venezuela or China.

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[1] Figures revised since issue of the Year Book for 1917.

The following table gives the figures for exports to non-contiguous territories (see also VII, *Territories and Dependencies*):

	1917	1918
Alaska	$38,992,049	$44,280,075
Hawaii	44,330,475	43,646,515
Porto Rico..	49,539,249	58,945,758
Philippines .	27,206,612	48,423,400
Guam	190,736	156,581
Tutuila	221,824	263,142
Total ...	$160,480,945	$195,715,471

Imports from Foreign Countries.—The gain in the value of imports, which has continued uninterrupted since 1911, save for 1915, was again evident in 1918. The total value for the latter fiscal year, ending June 30, was $2,946,059,403, as compared with $2,659,355,185 in 1917, an increase of about 11 per cent. The 1918 figure thus supersedes the 1917 value as the largest in our history. Imports from Europe, as was the case with exports to that continent, showed a decline in value, aggregating $199,000,000, or approximately 32 per cent. The greatest increase relatively was in imports from Oceania, 124 per cent.; while the largest absolute increase is credited to Asia, $211,000,000.

Thus, for the second time in recent trade history, European imports are forced to occupy a subordinate position in the import trade. The following ratios of European imports to the annual totals since 1912 is a striking picture of the decline of this continent as a source of American imports; 50, 49, 47, 37, 28, 23, and in 1918, 14 per cent. By reason of the increase in imports from every North American country except Bermuda, Guatemala, British West Indies and the Dominican Republic, this continent's share of the import trade of the United States rose from 29 to 31 per cent. of the total. All other continents also showed increases in value. Imports from South America did not continue the rate of increase shown in 1917, in spite of the enhanced value of imports from Argentina, Brazil, Chile, and Peru. The distribution of imports by continents was as follows:

Continent	1914	1915	1916	1917	1918
Europe..........	$895,602,868	$614,354,645	$616,252,749	$610,470,670	$411,578,494
North America...	427,399,354	473,079,796	591,895,543	766,112,537	918,488,901
South America...	222,677,075	261,489,563	391,562,018	542,212,820	567,276,702
Asia............	286,952,486	247,770,103	437,181,464	615,217,463	826,597,642
Oceania.........	42,144,398	52,522,552	96,225,991	65,328,379	146,205,707
Africa..........	19,149,476	24,953,081	64,765,745	60,013,316	75,911,957
Total.......	$1,893,925,657	$1,674,169,740	$2,197,883,510	$2,659,355,185	$2,946,059,403

The following table shows the imports from belligerent and neutral countries, grouped according to their status in November, 1918:

	1916	1917	1918
Entente allies......................	$1,694,662,225	$2,010,084,824	$2,240,896,003
Teutonic allies.....................	16,241,163	2,085,735	298,899
Neutrals............................	486,980,122	647,184,626	704,864,501
Totals..........................	$2,197,883,510	$2,659,355,185	$2,946,059,403

The value of the imports from the principal foreign countries since 1914 is shown in the table on the following page.

The year 1915 was one of general decrease in imports from the principal countries; 1916 was a period of general increase in imports from these countries, as was 1917 with a few exceptions, and in 1918 all except four of these principal import sources evidenced an increase in trade. Great Britain, France, Brazil and Italy, however, were together responsible for a decrease in imports of $204,000,000. The greatest gains were recorded for Canada, Japan, Argentina and the Straits Settlements. Argentina has moved forward until she now occupies fourth place in supplying the

IMPORTS FROM PRINCIPAL COUNTRIES

Country	1914	1915	1916	1917	1918
Great Britain....	$293,661,304	$256,351,675	$308,443,223	$307,674,853	$190,082,456
France..........	141,446,252	77,158,740	102,077,620	108,069,706	75,638,078
Brazil...........	101,329,073	99,178,728	132,663,984	151,638,245	113,511,954
Cuba............	131,303,794	185,706,901	228,977,567	253,395,410	264,024,006
Canada..........	160,659,709	159,571,712	204,018,227	320,949,492	434,254,567
Japan...........	107,355,897	98,882,638	147,644,228	208,127,478	284,945,439
Italy............	56,407,671	54,973,726	57,432,436	46,374,368	30,014,349
Mexico..........	92,690,566	77,612,691	97,676,544	112,138,677	140,801,097
British India.....	73,630,880	51,982,703	71,745,626	102,106,682	105,277,743
Argentina........	45,123,988	73,776,258	112,512,420	152,612,411	195,633,348
Chile............	25,722,128	27,689,780	64,154,859	113,789,130	141,075,704
China...........	40,311,340	40,829,710	72,405,278	112,022,104	140,777,343
Straits Settlem'ts.	26,307,860	24,989,878	82,114,598	89,984,946	159,188,127
Dutch East Indies	5,334,361	9,245,784	27,716,589	62,011,236	79,718,233
Phillippines......	18,162,312	24,020,169	28,232,249	42,436,247	78,101,412

United States, while Canada has gradually supplanted Great Britain in first place.

As in 1917, all of the great groups of imports showed an increase in total value (see table on fourth page, *supra*). "Crude materials for use in manufacturing" showed the greatest absolute increase in value, as was also true in 1916 and 1917. "Manufactures for further use in manufacturing" showed the greatest relative gain. While the group including "crude materials for use in manufacturing" continues to produce large absolute increases annually, its relative importance has declined from 43.1 per cent. of the total import value in 1916 to 41.7 per cent. in 1917 and to 41.6 per cent. in 1918. "Manufactures for further use in manufacturing" increased in relative importance to the total value, while "manufactures for consumption" showed a considerable decline. The former group has steadily increased from 14.1 per cent. of the total in 1915 to 18.7 per cent. in 1918. Other groups approximately retained their former position. Practically all of the important articles continued to increase in value, as was true in 1916 and 1917. The imports of the following important articles, however, declined in value: cars and carriages, coffee, copper manufactures, raw cotton, cotton manufactures, dyewoods, feathers, dressed and manufactured leather, glass and glassware, hats, hides and skins, pig iron, machinery, iron and steel in total, precious stones, graphite, silk manufactures, spirits and spirituous liquors, molasses. (See also XVI, *Statistics of Agriculture;* and XVII, *Statistics of Mineral Production.*)

The tremendous increase of 1917 in the importation of gold was not maintained during 1918, the total value of gold coin and bullion imported being $124,413,483, as compared with $977,176,026 in 1917. The year 1917 established a record for the importation of gold into the United States. Silver imports, however, greatly increased in 1918, totalling in value $70,328,153, as compared with $35,003,563 in the previous year. (See also XII, *Economic Conditions;* and XIII, *Banking and Currency.*)

Imports by Groups of Ports.—In 1917 the increase in imports was general at all the principal United States ports, but in 1918 the Atlantic coast, interior ports and Mexican border showed declines. Of the declines that of the Atlantic Coast loss was most important, aggregating about $51,000,000. Imports through Pacific Coast ports, on the other hand, showed an enormous increase ($258,000,000) thus maintaining the steady gain since 1915. These ports now are inferior only to the Atlantic ports in importance as regards imported merchandise. The following table shows the distribution of the imports of 1917 among the various groups of ports:

	1917	1918
Atlantic Coast..	$1,763,466,262	$1,712,161,676
Pacific Coast...	358,858,637	617,099,614
Northern Border	338,349,328	404,529,488
Gulf Coast.....	128,349,000	146,798,259
Interior Ports...	20,997,652	18,817,710
Mexican Border.	49,334,306	46,652,656
Total........	$2,659,355,185	$2,946,059,403

The following table shows in order of size some of the important ports in connection with imports:

	1917	1918
New York	$1,338,189,355	$1,251,790,373
Seattle	198,321,257	326,981,279
San Francisco	144,027,410	269,107,408
Boston	217,915,287	248,927,021
New Orleans	104,516,862	117,417,506
Buffalo	67,715,077	108,870,436
Philadelphia	109,485,782	101,527,257
Ogdensburg	98,659,602	92,357,796
Detroit	41,748,588	56,948,344
All customs districts	2,659,355,185	2,946,059,403

Imports from American Dependencies.—The value of merchandise imported from the non-contiguous territories of the United States during the fiscal year ending June 30, 1918, is shown in the table below (see also VII, *Territories and Dependencies*):

	1917	1918
Alaska	$60,135,205	$71,152,090
Hawaii	74,365,938	79,260,894
Porto Rico	73,062,221	65,054,503
Philippines	42,436,247	78,101,412
Guam	....	....
Tutuila	....	....
Total	249,999,611	293,568,899

Imports from the dependencies have had a steady increase in value since 1914, the annual gains being, respectively, 35, 30, 23, and in 1918, 17 per cent. Hawaii has steadily declined in relative importance since 1914 in the imports from dependencies. In 1918 Hawaii furnished only 27 per cent. of the total value of imports from dependencies, as compared with 30 per cent. in 1917 and 32 per cent. in 1916. On the contrary, the Philippines in 1918 furnished 27 per cent. of the total value, as compared with 16.9 per cent. in 1917 and 13.9 per cent. in 1916. Alaska also increased in absolute and relative importance at the expense of Porto Rico, which showed an absolute and relative decline, and Hawaii, which showed a small absolute increase but declined relatively. The total domestic imports from these countries exceeded the total exports to them by $97,853,428. Foreign merchandise valued at $1,036,503 and gold and silver valued at $13,321,911 were also received from the non-contiguous territories. Of the latter, practically all came from Alaska. (See also VII, *Territories and Dependencies.*)

The Balance of Trade.—The following official figures, which include receipts and shipments of both merchandise and specie, indicate the changes in the balance of trade incident to merchandise and to merchandise and specie for the past 18 years:

Fiscal Year	Merchandise			Merchandise and Specie		
	Imports	Exports	Excess of Exports	Imports	Exports	Excess of Exports
1900	$849,941,184	$1,394,483,082	$544,541,898	$929,770,670	$1,499,462,116	$569,691,446
1905	1,117,513,071	1,518,561,666	401,048,595	1,198,646,897	1,660,004,502	461,357,605
1910	1,556,947,430	1,744,984,720	188,037,290	1,645,504,529	1,918,834,796	273,330,267
1911	1,527,226,105	2,049,320,199	522,094,094	1,646,770,367	2,136,579,810	489,809,443
1912	1,653,264,934	2,204,322,409	551,057,475	1,749,251,653	2,326,541,422	576,289,769
1913	1,813,008,234	2,465,884,149	652,875,915	1,923,470,775	2,615,261,082	691,790,307
1914	1,893,925,657	2,364,579,148	470,453,491	1,990,790,920	2,531,582,700	540,791,780
1915	1,674,169,740	2,768,589,340	1,094,419,600	1,874,848,818	2,965,755,675	1,090,906,857
1916	2,197,883,510	4,333,482,885	2,135,599,375	2,726,047,186	4,483,523,956	1,757,476,770
1917	2,659,355,185	6,290,048,394	3,630,693,209	3,671,534,774	6,660,249,550	2,988,714,776
1918	2,946,059,403	5,928,285,641	2,982,226,238	3,140,801,039	6,258,319,264	3,117,518,225

Government Control of Exports and Imports.—The YEAR BOOK for 1917 (p. 516) gave an outline of the organization of the War Trade Board, which has had jurisdiction over practically all imports and exports. At the beginning of 1918 a large number of articles were exportable to neutral countries outside of Europe without licenses, while the list of articles for export to the Allies for which licenses were required was extended to embrace practically all important classes of goods. The principal activities of the War Trade Board during 1918 were as follows (see also I, *War Organization;* and II, *International Relations*):

1. *Creation of new agencies.*—A Contraband Committee was appointed, with powers to issue, withhold and refuse licenses in conformity with the policy of the Board, in order to expedite the handling of licenses. An Exports Control Committee was created by the War and Navy Departments and the Railroad Administration to assist the work of the War Trade Board by regulating the flow of export freight to various ports and to prevent congestion by proper distribution. A $5,000,000 corporation has been formed for the purpose of rendering economic aid to Russia under the direction of the War Trade Board. It will attempt to serve regions where transportation is inadequate and currency depreciated.

2. *Revision of export lists and agreements with foreign countries.*—During the year the export lists, enumerating articles to which various restrictions applied, were considerably modified. The regulations were relaxed as regards exports of raw cotton to the Allies or their colonies and of meat products to the West Indies and other neutrals who are largely dependent upon the United States for their supply. Canada was treated similarly. The restrictions were increased as regards wheat and rye products, blast and steel furnaces, rubber products, manufactures of gold, cadmium and zirconium metal, and dried fruits. Licenses for the exportation to Italy of structural iron, plates, nails, bolts, nuts, wire, bars, pig iron and other iron and steel products were granted only where freight rates did not exceed the rate established by the U. S. Shipping Board, the War Trade Board coöperating with the latter to regulate ocean rates. By the President's proclamation of Feb. 16, all exports were made subject to licensing regulations. On April 15 a new conservation list was issued, enumerating articles to be exported only under exceptional circumstances. Some of the articles added have been named above.

Trade agreements were entered into with various countries. Rationing agreements were made with Holland and Sweden, under which numerous chemical products and clothing were exportable by license. The list of products was afterward greatly extended. Agreements were entered into with foreign countries bordering on enemy territory whereby their exports to Germany were reduced 65 to 85 per cent. This agreement was also extended to Denmark. A commercial agreement was entered into with Spain, whereby cotton, petroleum and locomotives are to be furnished to cover Spanish requirements. A reciprocal agreement with Norway provided for the shipment to that country of foodstuffs, fertilizer, metals, rubber and miscellaneous commodities in exchange for ores and minerals, chemical products, wood and fish products. (See also II, *International Relations.*)

3. *Regulation of imports.*—Some regulation of particular imports, such as wool and ammonia, had previously existed, but on Feb. 16 the lack of tonnage necessitated a 50 per cent. reduction in imports and all imports were consequently placed by the President under license control. Accordingly, a list was prepared of about 80 less essential commodities, including breadstuffs other than wheat, all fruits except bananas and pineapples, all nuts except cocoanuts, all vegetables except lentils, beans and peas, luxuries, including jewelry, musical instruments, billiard balls, soap, perfumery, and feathers, agricultural implements, prepared cocoa and chocolate, coffee, cotton manufactures, eggs, malt liquors, and wines. In April a second list was issued, adding lime, talc, soapstone, shell-fish, tobacco leaf, fish, dairy products, animal oils, borax, cement, chloride of lime, cyanide of soda, ferromanganese, lead, meat products, paraffin, glassware, optical instruments and supplies, surveying instruments, telescopes, microscopes, glue, indigo, ivory, paper and paper stock, and vanilla beans. Rubber was added later. After Oct. 1 a new general import license permitted goods to be brought into this country from Great Britain, France and Italy and their colonies, if such goods were not among those specially reserved.

4. *Definition of the term enemy.*—The term "enemy" was extended in June by the President to apply to (1) certain classes of females; (2) internes in foreign countries; (3) persons disseminating information detrimental to the United States; (4) persons whose names appear on the Enemy-Trading List of the War Trade Board; (5) any citizen of an enemy country who has resided in his country since the outbreak of the war. Under certain conditions, branches of American corporations in neutral and Allied countries are permitting trade with the enemy where this is required by the law of the country in which they operate.

5. *Modification of procedure.*—The term during which an export license might be used was increased from 60 to 90 days. The Board decided that after Aug. 12 licenses for export would be refused if the applicant after Aug. 12 and before said license was issued began to manufacture or produce the articles specified for fulfillment of a specific export order. The object was to decrease the waste of effort and material expended on articles for which export permission is subsequently refused. Various modifications were made in the procedure for obtaining licenses.

INLAND WATERWAYS AND COASTWISE COMMERCE

Domestic Trade of the Great Lakes.—The official figures of the traffic passing through the American and Canadian Sault Ste. Marie canals in the calendar years 1916 and 1917, provided by the Chief of Engineers, U. S. Army, are shown in the following table:

Commodities	1916	1917
Coal, short tons......	16,123,119	18,298,853
Flour, barrel........	10,239,841	8,449,949
Wheat, bushel.......	226,063,315	185,899,449
Other grain, bushel...	93,189,561	67,415,795
Manufactured and pig iron, short tons....	202,194	102,082
Salt, barrel..........	109,000	84,656
Copper, short tons...	126,043	118,812
Iron ore, short tons...	63,452,107	61,374,090
Lumber, board-feet...	341,352,000	350,609,000
General merchandise..	903,865	658,365
Oil, tons............	227,679	262,489
Stone, tons..........	517,476	571,001
Total, short tons...	91,888,219	89,813,898

This shows a decrease of approximately 2,000,000 tons for the calendar year 1917, as compared with an increase for the previous year of over 20,000,000 tons. The only commodities which increased in tonnage were coal, lumber, oil and stone. Shipments of wheat, manufactures and pig iron, copper and general merchandise have been steadily declining since 1915. The increased traffic of 1916 was entirely due to the greater tonnage of grain other than wheat and iron ore. The total traffic of the St. Mary's Falls (American) canal for the year 1917 was 74,361,850 short tons, as compared with 75,085,219 tons in 1916 and 63,548,993 tons in 1915. The number of vessel passages of the American and Canadian canals and the tonnage of vessels using the canals are shown in the following table:

	Vessel Passages	Tonnage of Vessels
1915............	21,233	56,399,147
1916............	25,407	69,824,463
1917............	22,885	65,307,233

Of the total freight tonnage carried through the American and Canadian canals, steamers transported 85,566,016 tons, or 95 per cent.; sail and unrigged craft, 4,129,273 tons, or 4.5 per cent.; and unregistered vessels, 118,609 tons, or less than one per cent.

Statistics of the commerce passing through the Detroit River show a steady increase for 16 years. This increase was halted in the year 1917, the total freight tonnage decreasing by more than 5,000,000 tons, although the estimated value increased by $200,000,000. The following table shows the number of passages, net registered tonnage, estimated freight tonnage and value, for the years 1910 to 1917 inclusive:

	Number of Passages	Net Registered Tons	Freight Tons (estimated)	Estimated Value
1910..................	33,638	58,821,282	73,526,602	771,294,055
1911..................	30,612	52,142,703	66,951,231	745,167,201
1912..................	33,675	61,606,271	78,671,208	859,089,501
1913..................	37,473	62,092,149	85,376,705	927,191,016
1914..................	31,913	52,927,106	69,810,853	800,032,375
1915..................	34,823	65,280,425	82,514,457	1,021,528,978
1916..................	37,852	76,677,264	100,907,279	1,069,617,157
1917..................	33,061	69,267,723	95,243,119	1,269,590,776

Vessels to the number of 1,034 used this passage during 1917, as compared with 991 in 1916 and 1,072 in 1915. Of the total vessels in 1917, 847 were steamers, 181 sailing vessels, and six gasoline boats. The average tonnage of the vessels using the river was 2,596 in 1917, 2,585 in 1916 and 2,438 in 1915.

New York State Canals.—The value of the products transported on the New York State canals continued to decline, dropping from $27,513,525 in 1916 to $24,757,077 in 1917, in spite of rising prices. The tonnage moved decreased from 1,625,050 in 1916 to 1,297,225 in 1917. Of the total value of products transported, forest products comprised 33 per cent.; agricultural products, 11 per cent.; manufactures, two per cent.; merchandise, 41 per cent.; miscellaneous, 13 per cent.

Forest products increased in relative importance from the standpoint of value, as did also merchandise, while agricultural products and manufactures declined in relative importance. Of the freight tonnage moved *via* the Erie Canal about 13 per cent. consisted of through freight and 87 per cent. way freight, while in 1916 the respective percentages were 24 and 76. The way freight on the

Champlain Canal comprised 65 per cent. of the total tonnage, as compared with 48 per cent. in 1916. The following table shows the traffic of the various New York canals since 1910:

	TONNAGE ON NEW YORK STATE CANALS					Total Quantity	Total Value
	Erie	Champlain	Oswego	Cayuga and Seneca	All Others		
1910	2,023,185	684,027	110,079	80,125	175,996	3,073,412	59,042,178
1911	2,031,735	770,668	113,891	98,854	81,920	3,097,068	49,577,629
1912	1,795,069	590,723	83,580	80,753	55,991	2,606,116	38,444,617
1913	1,788,453	554,892	61,554	149,874	47,262	2,602,035	36,865,451
1914	1,361,764	492,014	55,705	128,698	42,669	2,080,850	28,277,991
1915	1,155,235	503,030	142,312	26,384	31,153	1,858,114	30,610,670
1916	917,689	506,528	135,948	44,421	20,464	1,625,050	27,513,525
1917	675,083	515,754	74,042	17,525	14,821	1,297,225	24,757,077

Canal improvements were continued during the year. Storage warehouses are now provided at 19 points and others are being constructed at Albany and Whitehall. Contracts have been entered into for the construction of new terminals for New York City.

Government Control of Water Transportation.—The Government acquisition of rail transporation facilities (see *Railroads, infra*) was accompanied by control of some portions of the water-transportation system. The waterways operated by the Railroad Administration included all the important Atlantic and Gulf coastwise lines, the lake-service line from Chicago and Milwaukee to Buffalo, the Cape Cod, New York Barge, Delaware and Raritan Canals, and the Mississippi and Warrior waterways. A marine section of the Railroad Administration was created, a Coastwise Steamship Advisory Committee, to supervise operations, a Federal manager of waterways, to have charge of the construction and operation of equipment on the Mississippi and Warrior waterways, and regional officers were appointed. Possession of the Clyde, Mallory, Merchants & Miners and Southern steamship lines was fully relinquished by the Government in December. (See also XII, *Economio Conditions.*)

EXPRESS COMPANIES

Official figures of the Interstate Commerce Commission show that the eight leading express companies in operation on Dec. 31, 1917, operated over an average of 307,400 miles, as compared with 296,211 on Dec. 31, 1916. Their aggregate gross operating receipts was $222,860,373 during the calendar year 1917, as compared with $190,420,552 during the preceding year. Payments for express privileges increased from $95,847,685 to $113,535,059, but the total operating revenue of the companies nevertheless advanced from $100,290,113 to $115,920,129. So rapid, however, was the increase in operating expenses, which rose from $89,675,386 to $113,721,057, that net operating revenue declined from $10,614,727 to $2,199,621. Taxes and uncollected revenue from operation caused a further decline in "operating income" from $8,819,362 in 1916 to a deficit of $184,305 in 1917. After accounting for income from other sources, there was a decline in "gross income" from $13,219,769 to $4,286,987; and after interest and other fixed charges were deducted, there was a decline in "net income" from $11,620,453 to $2,748,406.

During the early months of 1918 the revenue condition of the principal companies did not improve. They reported operating deficits of $1,637,757 in January, $945,741 in February, $813,074 in March, $1,046,244 in April, and $1,136,786 in May. The Interstate Commerce Commission authorized an increase of 10 per cent. in rates, which became effective for the most part on July 15 and 25 (50 I. C. C. Rept. 385) but was entirely absorbed by wage increases of July 1.

Meanwhile, the four principal companies, Adams, American, Wells-Fargo and Southern, were consolidated into a single company described as the American Railway Express Co. It obtained a contract from the Railway Administration under which the latter received 50¼ per cent. of the gross revenue received from the transportation of express matter by the Company. The balance of the Company's earnings after paying expenses and a cumulative dividend of five per cent. was to be divided between the Company, the Railroad Administration, and a guarantee fund in accordance with a pre-arranged plan. The present capital of the Company was fixed at $30,000,000.

A further increase of express charges was reported upon by the Interstate Commerce Commission in October, upon request of the Director-General of Railroads (51 I. C. C. 263, Oct. 22, 1918). In November the Director-General announced an advance, effective Jan. 1, 1919, of about 16 and 17 cents per 100 lb. on express merchandise east of the Mississippi and north of the Ohio, and about 75 per cent. of this increase in the case of express rates on foods. For the remainder of the country, merchandise rates were advanced about 10 to 12 cents per 100 lb. and food rates proportionately 75 per cent. as much.

On Nov. 16 the President signed a proclamation, effective Nov. 18, 1918, taking the American Railway Express Co. under Federal control. The Director-General of Railroads was given all the powers with respect to the express companies which had been conferred upon him by preceding proclamations and by the Act of March 21, 1918 (see *Railroads, infra*).

THE POST OFFICE

Cost of Postal Service.—The total revenues, expenditures and excess receipts and payments of the Post Office, as reported by the Post Office Department, are shown for the years since 1910 in the table below:

	Postal Revenues	Postal Expenditures	Deficit (−) or Surplus (+)
1910	224,128,657	229,977,224	− 5,848,567
1911	237,879,823	237,648,926	+ 230,897
1912	246,744,015	248,525,450	− 1,781,435
1913	266,619,525	262,067,541	+ 4,551,984
1914	287,934,565	283,543,769	+ 4,390,796
1915	287,248,165	298,546,026	−11,297,861
1916	312,057,689	306,204,033	+ 5,853,656
1917	329,726,116	319,838,718	+ 9,887,398
1918	388,975,962	324,833,718	+64,142,244

The surplus of $64,142,244 in 1918 was phenomenal in the history of the Department. Even without the increased rates in effect the surplus would have been $19,642,244. During the period from 1910 to 1918, inclusive, the revenues exceeded the total expenditures by $60,000,000, in spite of the exceedingly poor year 1915. This apparently demonstrates that the post-office service is now in a self-supporting condition, although the surplus for 1918 is, of course, largely due to the rate increases of 1917 (*A. Y. B.*, 1917, p. 522). The distribution of expense in the postal service for the last four years is shown in the following table:

	1915	1916	1917	1918
Service in post office	$139,936,546	$143,372,139	$148,964,353	$155,554,194
Railway mail service	28,408,243	28,515,475	29,340,950	28,789,142
Rural delivery service	49,805,851	51,964,735	55,150,740	52,309,496
Railway mail pay	59,576,288	61,692,461	62,750,551	61,319,309
Other means of transportation	17,337,637	17,239,945	19,694,114	20,434,253
Transportation of foreign mail	3,273,436	3,117,985	3,711,940	3,543,015

Railway Mail Pay.—Payments to railroads for the transportation of domestic mail in 1918 aggregated $61,319,309, as compared with the following in previous years: 1910, $49,405,311; 1911, $50,583,123; 1912, $51,691,301; 1913, $51,959,388; 1914, $56,155,496; 1915, $59,576,288; 1916, $61,692,461; 1917, $62,750,551.

The YEAR BOOK for 1916 (p. 535) analyzed the act to regulate mail pay on a space basis instead of a weight basis. With the authorization of the Interstate Commerce Commission the space basis was instituted on a number of roads in 1916, with the object of compiling information that would enable the Commission to fix a satisfactory basis of pay. During 1917 and 1918 the test proceeded and the necessary figures are in process of compilation. The Post Office Department, which favors the space basis, claims that the statistics show a considerable saving to the Government without injustice to the roads. The cost of the service on the weight basis was at the annual rate of $62,242,000; the same service on the space system would have cost $65,492,000. But by the space system the Department is enabled to reduce the number of car-miles of service required by adjusting the transportation to the needs of the service, and consequently the authorized service was at the rate of only $56,000,000. Practically all the railroad routes are at present being operated on the space basis, the maximum amounts possible under the law being paid, and the Post Office Department expects the decision in the Railway Mail Pay Case to still further reduce the cost.

War Service of the Post Office Department.—It was necessary for the Department to take up two very important obligations as a result of our entry into the war, first, a mail service for soldiers abroad, and second, an extension of domestic service to reach the camps and cantonments. After a study of the British and French systems a U. S. Army Post Office was opened in France and arrangements made for postal stations to follow the troops. In the United States, to take care of cantonment mail, military branch post offices were created, attached to and under the supervision of the nearest large post office.

The Espionage Act of June 15, 1917, amended May 16, 1918, made treasonable and seditious matter nonmailable and anyone attempting to circulate such through the mails subject to heavy fine and imprisonment. Under the provisions of the act the use of the mails has been denied to several publications suspected of being of a seditious nature, and considerable controversy arose at one time over alleged discrimination by the Department between publications. The Department was successful in the resulting suits. Under Section 19 of the Trading with the Enemy Act, licenses were issued to foreign-language newspapers, which were supervised with the assistance of college professors of modern languages.

Censorship of the mails was performed under the direction of a Censorship Board composed of representatives of the Secretary of War, Secretary of the Navy, War Trade Board, Postmaster-General, and the Chairman of the Committee on Public Information. Employees to the number of 1,600 were employed in this work, which aggregated 125,000 pieces of mail daily. The cost from Oct. 12, 1917, to June 30, 1918, was $509,742.

Pneumatic-Tube Service.—A controversy in progress for several years regarding the pneumatic-tube service in large cities was settled by the omission of any appropriation for this purpose for the fiscal year 1919. While admittedly of value at one time, the frequency of dispatch and the capacity of containers have so far failed to keep pace with the demands of the service that deliveries have to be made partially by vehicle transportation, and therefore with little extra cost may be entirely so made. An underground electric railway is now proposed in New York as a substitute for the pneumatic-tube system.

Other Post Office Services.—The following is a summary of other operations of the Post Office Department:

1. *The Foreign Mail Service.*—This consisted of an irregular service maintained with such vessels as were available. Parcel-post conventions were concluded with Portugal and the Society Islands. The weight of international parcel-post shipments increased 42 per cent. over 1917.

2. *The Parcel Post.*—This service handled during the fiscal year 1917 25,000,000 parcels more than during 1916.

The total weight of parcels so handled was over two billion pounds. Figures for 1918 are not available. The consent of the Interstate Commerce Commission has been asked to increase the weight limit from 50 to 70 lb. in the first and second zones, from 20 to 70 lb. in the third zone, and from 20 to 50 lb. in all other zones.

3. *Insurance.*—There was an increase in 1917 over 1916 of 8,900,342 parcels insured, or 35.6 per cent., as compared with an increase of 6,924,269 parcels in 1916; in 1918 the total number insured was 50,419,608, a gain of 49 per cent. A new coupon system of insurance was adopted in July, 1917, and the important policy of indemnifying shippers for partial damage. Under the coupon system a coupon receipt is given the shipper, a record made at the mailing office, and the package delivered at the office of address without any record being made. This dispenses with the tags previously attached to packages.

4. *C. O. D. Service.*—This service showed an increase of 1,761,439 packages during the fiscal year 1918. The limits of indemnity for lost and destroyed packages under this service were increased on July 1, 1917, from $50 to $100.

5. *Registered Mail.*—The total paid registrations in 1918 increased by 5,225,509 over the preceding year. In addition the registration service was extensively utilized for free Government mail. The total paid registrations were 42,018,347, and official free registrations 6,987,950.

6. *Postal Money Orders.*—The number of post offices at which this service is available was decreased during the year 1918, and the number of domestic orders decreased from 133,291,973 in 1917 to 122,686,471 in 1918. International money orders declined in number from 2,798,465 in 1917 to 1,569,374 in 1918. The total value of all money orders issued increased from $854,963,806 in 1917 to $940,514,219 in 1918.

7. *Postal-Savings System.*—See XIII, *Banking and Currency.*

8. *Air Mail Service.*—Airplane service has been inaugurated between New York and Washington, and arrangements are being made for the rapid extension of this type of service. (See also XX, *Aeronautics.*)

9. *Second-class Matter.*—The mailings of second-class matter in 1918 exceeded those of any previous year. The question of the deficit incurred in handling this class of mail became acute in view of the increase in the first-class rate. The War Revenue Act of Oct. 3, 1917, provides a flat rate on the portion of publications devoted to reading matter and a zone system for the portion devoted to advertising. The increase in rates will be gradual, reaching the maximum July 1, 1921 (*A. Y. B.,* 1917, p. 522). While the increase in first-class rates and the parcel-post package tax are war measures, the increase in second-class rates is intended as permanent legislation.

TELEGRAPHS AND TELEPHONES

Telegraphs.—The YEAR BOOK for 1914 (p. 532) contained a comparison of the telegraph industry in 1907 and 1912, as reported by the U. S. Census Bureau. Complete data for later years are not available, but the principal business operations of the Western Union Telegraph Co., which largely controls the business in the United States, are shown in the following table for the fiscal years ending Dec. 31, 1916 and Dec. 31, 1917:

	1916	1917
Stock (outstanding)...	$99,786,727	$99,786,727
Funded debt.........	31,994,000	31,994,000
Miles of wire........	1,631,657	1,631,278
Offices..............	25,234	25,466
Total income........	63,621,601	78,480,223
Expenses............	48,727,921	62,783,006
Net revenue.........	14,893,680	15,697,216
Interest, etc.........	1,331,850	1,331,850
Employees' bonus....	1,166,424	....
Net profits...........	12,395,406	14,365,366
Cash dividends......	5,984,567	6,982,298
Appropriated for reserve............	1,000,000	2,650,000
Surplus for year......	5,410,839	4,733,069

The corresponding operations of the principal competitor of the Western Union Telegraph Co., the Mackay Companies, a voluntary association of many allied telegraph companies, which controls the Commercial Telegraph Cable Co., and through it the system known as the Postal Telegraph, were as follows during the fiscal years ending Feb. 1, 1916, and Feb. 1, 1917:

	1916	1917
Common stock.......	$41,380,400	$41,380,400
Preferred............	50,000,000	50,000,000
Income from investments in other companies............	4,683,265	4,519,365
Operating expenses...	56,799	89,059
Balance.............	4,626,466	4,430,306
Dividends...........	4,069,020	4,425,198
Surplus for year......	557,446	5,108

Telephones.—The YEAR BOOK for 1914 (p. 529) gave a comparison of the telephone industry in 1907 and 1912, as reported by the U. S. Census Bureau. As in the case of the telegraph industry, complete data for later years are not available, but the operating returns of the American

Telephone & Telegraph Co. in 1916 and 1917 were as shown in the following table, and are significant, if not inclusive:

	1916	1917
Capital stock	$395,635,619	$435,658,725
Funded debt	185,002,100	190,753,300
Stations[1]	9,847,192	10,475,678
Miles of wire[1]	19,850,315	22,610,487
Total earnings[1]	50,932,051	56,237,063
Net earnings[1]	44,743,376	48,940,466
Net income[1]	38,013,277	38,471,106
Dividends[1]	31,122,187	32,481,614
Surplus for year[1]	6,891,090	5,989,492

[1] Figures for the American Telephone & Telegraph Co. proper.

The combined operations of the entire Bell System (except the Western Union Telegraph Co.), excluding all duplications, are shown in the following table for the years ending Dec. 31, 1916, and Dec. 31, 1917:

	1916	1917
Gross earnings	$271,655,664	$302,870,819
Operating expenses and taxes	111,482,510	136,265,878
Maintenance and depreciation	84,555,515	94,070,499
Net earnings	75,617,639	72,534,442
Interest	18,378,931	21,820,231
Net income	57,238,708	50,714,211
Dividends	35,160,119	36,862,582
Surplus for year	22,078,589	13,851,629

Government Control.—On July 31, 1918, the Government assumed control of the telegraph and telephone systems of the country. The business continued to be conducted through ordinary channels and by the same employees. The Postmaster-General became Director-General of the Wire Service. An agreement with the American Telephone and Telegraph Co., entered into early in October, provided:

1. The operations shall remain on a basis of efficiency relatively equal to the past.
2. The property shall be returned in as good condition as when taken.
3. Appropriations from current revenue for maintenance, depreciation and obsolescence shall be the same as in the past.
4. Amortization of intangible capital shall be relatively equal to the past.
5. Employees' pensions, disability benefits and death benefits now in operation shall be continued.
6. Federal state and municipal taxes shall be borne by the Government.
7. American Telephone & Telegraph Co. license and rental contracts shall be continued.
8. The Government shall pay the interest and existing amortization charges on all outstanding securities or obligations of the Bell system in the hands of the public.
9. The Government shall pay dividends at the existing rate upon the share capital of the Bell system outstanding in the hands of the public.
10. Payment of any charges, interest, dividends or other costs on new securities issued in discharge, conversion, renewal or extension of present obligations shall be made by the Government.
11. Extensions to its property made with the approval of the Bell system by money furnished by the Postmaster-General shall be paid for in installments of five per cent. a year.

Long-distance telephone rates were considerably reduced in December, 1918, and shortly before this a reduction had taken place in the cost of the "night letter" telegram.

On Nov. 2, 1918, the Postmaster-General assumed possession, control and supervision of the marine-cable systems. The cable companies continue operation as usual. Regular dividends heretofore declared and maturing interest may be paid and maturing obligations may be renewed or extended. No definite agreement has yet been announced as a basis for continued possession.

Private-Wire Contracts.—An important decision by the Interstate Commerce Commission (No. 5421) involves the right of applicants to secure private-wire service without discrimination. It was held that the telegraph companies might properly classify their services and that it was reasonable separately to classify the private-wire service if some of its abuses were removed. But the difference in charges for this, as compared with other services, cannot be justified on the "wholesale" theory, which does not apply to common carriers, nor is there any analogy between this and the "carload-lot" practices of the railroads. This private-wire service is subject to the Interstate Commerce Act and service should be furnished to all applicants, without discrimination, in the order of their application. The service is aparently not unduly prejudicial to the users of the public telegraph service, but one abuse to be removed is the use of public wires at half the regular rates when the private-wire service is interrupted.

STREET RAILWAYS

Returns of the Electric Railway Association for the years ending Dec. 31, 1916 and 1917 show that although the operating revenues per mile of line of the companies included increased from $21,296 to $22,525, or 5.77 per cent., their operating expenses advanced more rapidly from $13,312 to $15,013 or 12.78 per cent. Their net earnings consequently declined from $7,984 to $7,512 per mile of line, or 5.91 per cent. The heaviest increases in expenses occurred in the case of power and equipment expenses, which advanced 24.31 per cent., and 13.77 per cent., respectively. Expenses for maintenance of way and structures, on the contrary, advanced but 1.52 per cent., and traffic expenses declined 18.18 per cent. The operating ratio of 108 companies has rapidly risen from 61.85 per cent. in 1914 to 62.81 per cent. in 1915, 62.84 in 1916, 66.37 in 1917, and 70.5 per cent. during the first three months of 1918. Difficulty has moreover been experienced in refunding maturing securities and in obtaining funds to make needed improvements.

Returns for the first quarter of 1918 indicate that the relationship between earnings and expenses has continued during the year. While operating revenues advanced 2.54 per cent., operating expenses increased 11.17 per cent. and net earnings declined 13.97 per cent. Efforts were therefore made to increase passenger fares both on urban and interurban lines. Five-cent fares for specified zones were raised in various instances to six cents with the consent of public-utilities commissions. Larger increases have been less common. Simultaneously there have been numerous commission orders requiring the maintenance or improvement of services. (See also VI, *Municipal Government;* X, *Public Services;* and XX, *Electrical Engineering.*)

The extent to which the wages of electric-railway employees are involved in the difficulties of many of the companies has arrested the attention of the National War Labor Board. It was agreed generally that the payment of a living wage is the foremost consideration and that if this cannot be accomplished without raising fares, action to bring about such increase in fares becomes essential. (See also XV, *Labor.*)

RAILROADS

Physical Condition and Services.—In the Director-General's report of Sept. 3, 1918, the total steam-railway trackage in operation in the United States on Dec. 31, 1916, was stated to have been 397,014 miles. This trackage was owned or controlled by 2,905 companies, 185 of which operated major systems; 221 were switching and terminal companies; 1,434 operated "plant facilities," mainly in the interest of certain plants or industries; and 765 operated so-called "short lines" which depend upon the large systems for through connections. The Bureau of Railway Economics reports that on Dec. 31, 1917, the single-track mileage of all railways having annual operating revenues above $1,000,000 amounted to 232,699 miles, and their total trackage to 368,663 miles.

The Operating Statistics Section of the Railroad Administration reports that the average number of freight cars in service increased from 2,265,018 in August, 1917, to 2,342,032 in August, 1918, and that during the same period the average number of freight locomotives in service increased from 29,893 to 30,450. The Bureau of Railway Economics reports that on Dec. 30, 1917, the total number of freight cars in service on lines having annual operating revenues above $1,000,000 was 2,329,683; passenger cars, 52,949; company service cars, 99,616; and steam locomotives of all types, 61,512. The employees numbered 1,732,703.

The revenue ton-miles of freight traffic of the railroads increased from 259,774,409,000 during the eight months ending August, 1917, to 262,655,501,000 during the eight months ending August, 1918, and during the same period the total ton-miles of traffic grew from 283,486,027,000 to

285,727,324,000. Total freight car-miles simultaneously declined from 15,186,059,000 to 14,542,240,000, and freight train-miles from 436,045,000 to 425,830,000. The average number of tons per train advanced from 650 to 671, and average tons per loaded car from 26.7 to 28.9.

Revenues and Expenses.—The revenue and expense condition of the railroads during the first half of the calendar year 1918, the first half-year of Federal control, was decidedly unfavorable. Total revenues from operation amounted to $2,081,448,000, as compared with $1,897,930,501 during the corresponding months of 1917. Freight revenues during the first half of 1918 aggregated $1,434,723,000; passenger revenues, $448,209,000; mail revenues, $27,122,000; express revenues, $56,822,000; other transportation revenues, $55,855,000; incidental operating revenues, $56,796,000, and the remainder constituted joint-facility revenues. Operating expenses, however, during the first half of 1918 advanced with extraordinary rapidity from $1,354,012,000 in the corresponding period of 1917 to $1,815,707,000, with a resulting decline in net railroad operating revenue from $543,919,000 to $265,741,000. The increased operating expenses were distributed as follows:

	First Six Months, 1918	First Six Months, 1917
Maintenance of way and structures........	$287,199,132	$218,566,803
Maintenance of equipment....	461,399,840	326,384,886
Traffic expenses.	27,747,379	32,083,867
Transportation expenses.....	967,571,816	717,465,395
Miscellaneous operations....	18,975,016	16,029,562
General operating expenses..	55,656,602	46,949,637
Transportation for investment	2,843,258	3,468,441
Total........	$1,815,706,527	$1,354,011,709

There was an increase in each general group of operating expense excepting only those defined as traffic expenses. Tax accruals, moreover, advanced from $85,400,088 to $92,237,876, so that, although uncollectible revenues declined slightly, "railway operating income" was reduced from $458,203,531 to $173,194,407; "net income", after deducting equipment rents and joint-facility rents, declined from $440,050,413 to $151,657,111; and the ratio of operating expenses to operating revenues rose from 71.34 per cent. to 87.23 per cent.

After June, when the full effect of freight-rate and passenger-fare advances (see *infra*) became operative, the revenues of the railroads increased. Gross earnings increased from $362,509,561 in August, 1917, to $498,269,356 in August, 1918, or 37.45 per cent. Expenses in August, 1918, however, exceeded those of August, 1917, by $111,447,037, an increase of 45 per cent., so that net earnings for the same month increased only $24,312,758. Net earnings in August, 1918, aggregated $142,427,118, as compared with $118,114,360 in August, 1917. (See also XII, *Economic Conditions.*)

Capital Expenditure and Advances.—All the lines under Federal control were ordered on Feb. 2 to submit budgets of such improvements as they regarded as immediately necessary. The budgets for capital expenditures, as distinct from sums chargeable to maintenance, amounted to $1,328,493,609, but this was trimmed down to $975,105,416 by the Division of Capital Expenditures of the Railroad Administration. Later the amount originally authorized was gradually increased until early in September it reached $1.151,967,240. This total was distributed as follows: additions and betterments, $441,604,460; equipment, $666.824,180; extensions, branches and line construction, $43,538.600.

The amounts needed were provided in part by the railroad companies and in part by advances from the Railroad Administration. The advances of the latter were not, however, made exclusively to meet capital expenditures of this kind. Some of the funds advanced were for the payment of authorized dividends pending agreement upon the contracts between the carriers and the Government, and some to meet maturing obligations. The total advances to Nov. 1, 1918, exclusive of current earnings applied directly to current expenses and corporate needs, amounted to $363,116,-

970; and in addition $53,433,628 had been advanced to equipment builders on account of standardized cars and locomotives (see XX, *Mechanical Engineering*). The advances to railroads included 100 companies and systems, the largest amounts going to the following railroads, which are arranged in the order of the respective advances received: Pennsylvania Railroad Lines, New York Central Lines, New York, New Haven & Hartford, Baltimore and Ohio, Chicago, Milwaukee & St. Paul, Illinois Central, and the Erie Railroad. Each of the above received advances exceeding $10,000,000.

Freight Rates and Passenger Fares.—To provide for the rising costs of operation and maintenance, particularly the advance in wages and in the prices of supplies, the Director-General on May 25 in General Order No. 28 ordered an average increase of about 25 per cent. in freight rates. More specifically, he ordered the following:

1. All interstate class rates advanced 25 per cent.
2. All intrastate class rates advanced 25 per cent., where no interstate class rates are published between the same points; the application of the Official, Southern and Western Classifications was ordered except in Illinois where the Illinois classification is authorized.
3. Cancellation of all intrastate class rates published between the same points, and the application in their stead of the interstate rates authorized in 1 above.
4. No class rates to be lower than the minimum specifically authorized in the Director-General's order.
5. The commodity rates on many named commodities to be increased by stated amounts per 100 lb. or tons, or a stated per cent.
6. All other interstate commodity rates to be advanced 25 per cent.
7. All intrastate commodity rates increased by the amount referred to under 5 and 6 above where no interstate commodity rates are published between the same points.
8. Cancellation of intrastate commodity rates where interstate commodity rates are published between the same points.
9. Cancellation of all export and import rates.
10. All intrastate rates and all rates for transportation by water increased under the order to be filed with the I. C. C. except rates ordered to be cancelled.
11. No less-than-car-load charge to be less than provided in the classification governing and in no case less than 50 cents.
12. No carload charge, other than for a switching service, to be less than $15 per car.
13. Established rate groups and differentials not to be compulsory, but to be used if found desirable and practicable.

As numerous protests against some of the changes incident to Order No. 28 arose, efforts were made to adjust complaints without the need of formal complaints to the Interstate Commerce Commission. The regional and district freight-traffic committees of the Railroad Administration were reorganized so as to give representation to shippers. A new rate-making plan was thereby inaugurated. Not only are rate charges initiated by the Director-General acting for the President as is authorized by the Railroad Control Act of March 21, 1918, instead of by the carriers as was formerly the case, but most complaints are, if possible, to be adjusted through these reorganized joint committees instead of by the Interstate Commerce Commission and other regulating bodies. The joint traffic committees also displace the established freight-traffic associations in which formerly the carriers alone were represented.

While the rate advances made effective by Order No. 28 change numerous rate relationships, their main effect is an advance in the general level of rates. The Railroad Administration has also proposed to standardize class rates throughout the country with a view to eliminating inequalities and discriminations in existing class-rate schedules. The Director-General has submitted to the consideration of the Interstate Commerce Commission and the state commissions a system of tentative class rates graded on mileage scales. Under the proposed plan the country is divided into six territories. It contemplates dividing the region west of the Mississippi and Lake Michigan into four zones, each with scales of rates bearing a percentage relationship to each other. If the plan becomes effective, two of the western zones are to bear a basis of 100 per cent., one is to be on a 75-per cent. basis, and another on a 120-per cent. basis. For southern territory an alternative scale is proposed as a possible substitute for the 100-per cent.

scale, while for the territory north of the Ohio and east of the Mississippi no new scale is at present proposed because class rates in this territory have already been established on a more uniform basis than elsewhere. The proposed mileage-scale plan is now under consideration, various conferences and hearings having been conducted, at which shippers have entered protests.

Order No. 28 also increased passenger fares throughout the United States as follows:

1. All inter- and intrastate fares of lines under Federal control to be advanced to a basis of at least three cents per mile.
2. Fares which are on a lower basis to be discontinued subject to the provisions of the Interstate Commerce Act authorizing free or reduced-fare transportation. Mileage tickets are not, however, to be issued at rates affording lower fares than the regular one-way tariff fare. Nor shall excursion or reduced fare be issued, except that round-trip tourist fares may be established at a reasonable relationship to one-way fares and that reduced fares may be granted to certain named organizations.
3. Where public convenience is served, fares determined by short lines may be applied over longer routes.
4. Naval and military passengers may travel at reduced fares.
5. Children under five years of age when accompanied by parent or guardian may be carried free of charge, and those between five and ten years of age at half fare.
6. Commutation fares to be advanced 10 per cent.
7. Passengers in standard sleeping or parlor cars to pay an additional fare of 16 2-3 per cent. of the one-way fare, and those in tourist sleepers an additional fare of 8 1-3 per cent. of the one-way fare, and the minimum number of tickets required for drawing rooms and compartments is prescribed; excess baggage charges are fixed at 16 2-3 per cent. of the one-way fare, with a minimum of 15 cents per 100 lb. and 25 cents per shipment.
8. Stop-overs on one-way tickets, side trips at free or reduced fares, discounts by use of excess-baggage permits or excess money coupons, and one-way tickets bearing a limit in excess of the time needed for a continuous passage to be discontinued.

UNITED STATES RAILROAD ADMINISTRATION

Organization.—The organization of the Railroad Administration has been rapidly extended since the President in his proclamation of Dec. 26, 1917, took possession and assumed control of the railroads and appointed W. G. McAdoo Director-General of Railroads. Under the Director-General there is now (1) a central administration to control the various functions of transportation, (2) regional administration to administer the railroads within prescribed territorial regions, and (3) various advisory commissions and committees. The regional control is exercised in seven defined regions known as the Eastern, Allegheny, Pocahontas, Southern, Northwestern, Central Western, and Southwestern regions.

The Central Administration is made up as follows:

1. The Director-General with a general staff including an assistant Director-General and several assistants, an assistant to the Director-General, an advisor on finance, purchases and equipment, an actuary and a private secretary to the Director-General.
2. Division of Finance and Purchases, including, in addition to a director and staff, a finance-section advisory committee, a purchasing-section advisory committee, a procurement section, forest-products section, advisory committee on insurance and fire protection, and an insurance and fire-protection section.
3. Division of Capital Expenditure, with a director, engineering assistant, accounting assistant, and a secretary.
4. Division of Operation, including a director and immediate staff and a car-service section, car record office, mechanical department, committee on mechanical standards, inspection and test section, safety section, fuel conservation section, telegraph section, troop-movement section, operating-statistics section, Pullman-car lines section, committee on freight-traffic control, engineering and maintenance department, marine section, a coastwise steamship advisory committee, and a Federal manager of coastwise steamship lines.
5. Division of Traffic, with a director and staff and the following sections and committees: mail and express section, agricultural section, Eastern, Southern and Western passenger-traffic committees, ticket-standardization committees, advertising committee, committee on consolidated classification, Eastern, Southern and Western freight-traffic committees, district freight-traffic committees for 20 traffic districts, and seven inland traffic managers representing the Director-General in the War and Navy Departments, the Shipping Board, Food Administration, Fuel Administration, Petroleum Section of the Fuel Administration, and the War Industries Board.
6. Division of Public Service and Accounting, having a director and office staff and an accounting committee, an auditing section, traffic section, and short-line section.
7. Division of Labor, with a director and staff, three railway boards of ad-

justment, and a Women's-service section.

8. Division of Law, with a general counsel and staff, and a property-protection section, a claims section, and committee on compensation and contracts.

9. Division of Inland Waterways, with a director, a Federal manager of the New York-New Jersey canals, and a Federal manager of the Mississippi and Warrior waterways.

The regional administration in each of the seven operating regions is made up as follows:

1. A regional director.
2. A general staff for each regional director, consisting in most cases of an assistant regional director, and assistants in charge of operating, traffic, mechanical work, and engineering. The number of assistants in charge of specific functions is, however, subject to variation. In the Eastern region there is also a budget committee, a North Atlantic ports freight-traffic committee with various subdivisions, and a marine department; in the Allegheny region, a freight-traffic committee; in the Southern and Southwestern regions, an export committee; in the Central Western region, a sailing-day plan committee; and in each of the regions there is a regional purchasing committee.
3. District directors to supervise the lines in defined subdistricts, although district directors have not been appointed in every region.
4. A Federal manager for each individual railroad.
5. In most of the regions one or more terminal managers.

The advisory commissions and committees include a Board of Railway Wages and Working Conditions; a Port and Harbor Facilities Commission; an Exports Control Committee, and a Committee on Inland Waterways.

Increased Wages of Railroad Employees.—On May 25 the Director-General, partly on recommendation of the Railroad Wage Commission and partly on his own initiative, ordered an advance in the wages of railroad employees formerly earning $249 or less per month. The advances range from 43 per cent. for the lowest-paid employees to nothing for those receiving $250 or more per month, with a minimum advance of 2½ cents per hour in the pay of common labor. Simultaneously eight hours was made the basic work day throughout the railroad service. On recommendation of the Board of Railroad Wages and Working Conditions the wage of employees in the mechanical departments of railroads was also ordered raised, with a minimum basic rate of 68 cents per hour for all except certain named classes of employees who have had four or more years of experience and who on Jan. 1 were receiving less than 55 cents per hour. For other employees in the mechanical department a minimum basic wage of 58 cents per hour was ordered. The eight-hour basic work day with time and a half for overtime was likewise established. (See also XV, *Labor.*)

Rearrangement of Routes and Line Services.—Freight routes in various parts of the country have been rearranged with a view (1) to eliminating circuitous routes, (2) to reducing cross routing, and (3) to reducing congestion. Though less has been accomplished than was anticipated from the Director-General's announcement of Dec. 29, 1917, because of the congestion of existing direct routes, there are numerous instances in which well graded new short routes have been developed, in which traffic was diverted from one line to another, and in which shipments were rerouted for the purpose of avoiding congestion. The reduction of cross routing has been difficult because it concerns the business methods of shippers and consignees as well as those of the carriers, but a beginning was made in a bituminous-coal zoning plan jointly established by the Railway and Fuel Administrations.

Similar steps incident to the unification of line transportation and routes have been taken on various occasions in the elimination of duplicate local freight services on joint tracks and in the rearrangement of freight-train schedules for perishable commodities. Alternating trains for the transportation of fresh fruits and vegetables, meats, and packing-house products have in a measure displaced the duplicate trains formerly scheduled by competing lines.

Passenger-train schedules have also been revised, particularly with a view to eliminating duplicate trains of competing lines. There has likewise been some revision so as to make connections closer; consolidated time tables have been issued, and railroad tickets between points reached by several lines are honored by any of the routes so that passengers may freely board the trains leaving at the most convenient times. A universal mileage book has been adopted, good on any line under Government control.

Joint Use of Terminals.—The operating and improvement difficulties encountered in terminal operation are such that no general unification of terminals has been accomplished. The principle of joint use of terminals has been extended at various points both in the passenger and freight services, but being largely local in character, it has been more difficult to effect than the unification of line services, equipment, or other facilities. A number of special terminal committees have been appointed at various points to consider plans for joint terminal operation.

Joint Use of Equipment.—The box-car pool and eastern coal-car pool which were established before the railroads were taken over by the Government have since been administered by the Car Service Section of the Railroad Administration. The practice of diverting freight cars from one line or section of the country to another as needed, which was also begun by the former Railroad War Board and which was later extended by the Commission on Car Service, has since been extended through the Car Service Section. One hundred thousand of standardized types of freight cars (see XX, *Mechanical Engineering*) have been ordered. The practice of paying mileage or *per diem* charges for the use of foreign passenger or freight cars has been discontinued as between lines under Government control, the companies having been ordered to bill each other for the use of rolling stock at the rate which will represent the actual cost of maintenance, operation, etc.

The number of locomotives diverted to foreign lines since the establishment of Government control has increased somewhat, although each line has for the most part needed the greatest share of its own locomotives. Standardized locomotives (see XX, *Mechanical Engineering*) to the number of 1,430 have been ordered, some of which will probably be used to replace railroad-owned engines and others as a "flying squadron" for use wherever most needed.

Joint Use of Repair Shops.—Under arrangements made by the Car Repair Section of the Railroad Administration a beginning has been made in the repair of freight cars in foreign shops so as to utilize available shop facilities and curtail useless empty-car mileage. The practice of repairing locomotives in foreign shops has similarly been extended under the supervision of the Locomotive Section of the Railroad Administration.

Unified Purchasing of Supplies.—Competition between separate lines in the purchasing of railroad supplies has been reduced through the supervision over purchases exercised by the Division of Finance and Purchases, which is in direct charge of the placing of orders for rails, locomotives, and cars, and which supervises the purchase of other supplies with the aid of a Central Advisory Committee and of regional purchasing committees. Much of the buying done for the account of the railroads has been entrusted to the regional committees which have headquarters at New York, Chicago, and Atlanta.

Separation of Operating and Corporate Organizations.—The presidents and other corporate officers of the railroad companies as distinct from those officers whose duties are primarily operative were released from all responsibility for the operation of their properties. Some of the corporate officers remained as officers of their companies to protect the interests of their owners, stockholders and creditors, while others were appointed as officials of the Railroad Administration. The total number of operative officials receiving salaries of $5,000 per year or over has been reduced from 2,325 to 2,061. Their aggregate annual salaries were $21,320,000 under company control, as compared with $16,705,000 since the change was effected.

Pullman Car Service.—The sleeping and parlor cars and the services performed in them by the Pullman Company were placed under the control of the Railroad Administration. The Director-General announced that the step was taken "in the public interest as well as because the sleeping cars were much in demand for military purposes". The employees in the Pullman service were awarded the same advance in wages as had previously been granted to railroad employees.

Store-Door Delivery. — To reduce the delay in unloading cars upon arrival at congested terminals the so-called "store-door delivery" plan was inaugurated at New York and Philadelphia. Through the coöperation of the carriers, commercial organizations and truckmen, arrangements were made to deliver freight as soon as possible after arrival under rules and subject to charges established by drayage directors.

Demurrage Charges and Rules.— The national car-demurrage rules and charges, which had been amended on several occasions before the establishment of Federal control, were further amended during 1918 with a view to speeding up the loading and unloading of freight cars and the relief of congestion. The latest amendment became effective on Oct. 15. A sliding scale of charges ranging from $3 to $10 per car per day has been in effect since Feb. 10.

The Federal Control Act.—Acting under the Army Appropriation Act of Aug. 29, 1916, the President took over the railroads in his proclamation of Dec. 26, 1917 (*A. Y. B.*, 1917, p. 533). It was deemed necessary, however, to enact further legislation both because the expenditure of funds had not been authorized and because certain definitions of powers and procedure were regarded desirable. The principal provisions of the Railroad Control Act of March 21, 1918, are as follows:

1. Each line taken over was guaranteed amounts not exceeding its average annual railway operating income for the three years ended June 30, 1917. In computing such railway operating income it was specifically provided that debits and credits arising from equipment rents and joint-facility rents shall be included, but that those arising from the operation of street electric passenger railways, including interurbans, such as are at the time of agreement with the railroad not under Federal control shall be excluded; also that the regular taxes of each line are to be included; but that all distinctly war taxes are to be paid by the line out of its own funds. It is noteworthy that the "railway operating income" as defined in the Act and the accounting rules of the Interstate Commerce Commission does not include interest charges nor dividends. These sums are not specifically guaranteed by the Government; they are paid out of the funds of the company itself.

The average annual railway operating income shall be ascertained by the Interstate Commerce Commission and certified to by the President. If no agreement is made with a carrier, or pending its execution, the President may pay an annual amount not exceeding 90 per cent. of the estimated annual amount of just compensation.

2. The agreements between the carriers and the Government provided for in the Act, besides specifying the amount of the annual operating income to which a line is entitled, shall contain adequate provisions for the maintenance, repair, renewals, and depreciation of its property, for the creation of reserve funds necessary for these purposes, and for requisite accounting and adjustment of charges and payments so that "the property of each carrier may be returned to it in substantially as good repair and in substantially as complete equipment as it was in at the beginning of Federal control", and that the United States may be reimbursed for additions, repairs, renewals, and betterments not justly chargeable to the Government.

3. When making additions and betterments or extensions with the approval or by order of the President, the carrier is entitled to additional compensation at "a reasonable rate per centum to be fixed by the President upon the cost" incurred.

4. Dividends shall not exceed the regular rate of dividends paid during the three years ending June 30, 1917, unless the President approves a higher dividend.

5. A revolving fund of $500,000,000 was created to pay the expenses of Federal control and the amount of just compensation to carriers so far as necessary; to provide terminals and equipment; to make advances to carriers for additions, betterments, extensions, and equipment; to purchase securities at prices not exceeding par and make advances to cover maturing obligations; or to facilitate the use and operation of canals and for the purchase, construction, or use and operation of transportation facilities on inland and coastwise waterways.

6. The President's approval must be obtained before carriers under Federal control may issue securities to provide funds for maturing obligations or for other legal and proper expenditures or for reorganization.

7. Carriers under Federal control remain subject "to all laws and liabilities as common carriers, whether arising under state or Federal laws or at common law, except in so far as may be inconsistent with the provisions of this Act or any other Act applicable to such Federal control or with any order of the President."

8. Nothing in the Act is to be construed "to amend, impair, or affect the existing laws or powers of the states in relation to taxation or the lawful police

regulations of the several states, except wherein such laws, powers, or regulations may affect the transportation of troops, war materials, Government supplies, or the issue of stocks and bonds".

9. The President is authorized to initiate charges, classifications, regulations, and practices by filing them with the Interstate Commerce Commission and the Commission may not suspend them pending final determination. It may, however, upon complaint enter upon hearings concerning their justness and reasonableness and thereupon make such orders as the Act to regulate commerce authorizes. In so doing the Commission is required to give due consideration to the absence of competition under Federal control, and to any certification from the President to the effect that it is necessary to increase railway operating revenues in order to defray the expenses of Federal control and of operation fairly chargeable to operating expenses, and to pay railroad taxes other than war taxes and net rents for joint facilities and equipment, and compensation to carriers.

10. The President is authorized to exercise the powers conferred upon him through any agencies selected by him, and to avail himself of the advice and assistance of the Interstate Commerce Commission.

11. The transportation systems under Federal control are to be returned to their owners within one year and nine months following the ratification of the treaty of peace, but "the President may relinquish all railroads and systems of transportation under Federal control at any time he shall deem such action needful or desirable". The Act is expressly declared to be emergency legislation enacted to meet war conditions.

The Railroad Contracts.—In applying the provisions of the Federal Control Act relative to the contracts or agreements under which the railroads were to be operated and compensated many differences arose between the Railroad Administration and the companies. The differences were due in part to the lack of preciseness in the wording of the Act and in part to the divergent interests of the parties interested relative to what constitutes a normal improvement, extension or betterment, what rate of interest shall be allowed on sums so expended by the companies, what makes a railroad safe for operating purposes, what is to be included in railway operating income, and to what extent is the Government liable for damages done to railroad property during the period of Federal control. Standard clauses for the contracts for use in ordinary cases, however, were arrived at in September, subject to the Government's reserved right to insist upon different clauses in cases requiring different treatment. There are various questions concerning subsidiaries, terminals, industrial leases, etc., which are left for further treatment in the contracts with individual companies. The contract has not to date been formally accepted by all the companies.

A standard contract for short lines, the operation of which has not been taken over by the Government, was also approved and promulgated by the Director-General in October. It defines the treatment of these lines concerning the division of their charges on interline traffic, allotment of cars, rental on cars, free time for loading and unloading, routing of competitive traffic, and publication of tariffs. The short lines until their operation is assumed by the Government receive all their revenues and are responsible for all expenses and obligations.

RULINGS OF THE INTERSTATE COMMERCE COMMISSION

Relations with the Railroad Administration.—Federal control of railroads has reduced the number of important decisions rendered by the Interstate Commerce Commission, because under the Railroad Control Act changes in charges, rates, etc., are initiated by the Railroad Administration and the Commission has for the most part been inclined to coöperate with the Director-General. The Act prevents the Commission from suspending charges so initiated pending examination (see *supra*), but it does not deprive the Commission of the legal right, upon complaint and after holding hearings, to revise rates as to reasonableness and unjust discrimination. The Director-General in Order No. 28, in which the general level of freight rates and passenger fares was raised, states specifically that

> in the nature of things no such far-reaching step can accomplish ideal equalization as between the numerous interests necessarily affected, and doubtless the Commission will find it proper to make readjustments to obtain a nearer approach to such equalization.

The Commission has since asserted

its rate-revising powers in the Willamette Valley Case (see *infra*).

It is notable, however, that the Railway Administration is not confining its rate-making activities to adjustments designed to provide needed revenues. The primary purpose of its proposed class-rate scales is to readjust rate structures with a view to equalizing and standardizing them (see *supra*). The organization of joint freight-traffic committees, moreover, signifies a desire in the future to bring about needed adjustments informally through these committees instead of through the Interstate Commerce Commission.

Decisions and Reports.—Among the principal decisions and reports rendered by the Commission during 1918 are the following:

1. Willamette Valley Lumberman's Association *v.* Southern Pacific Co. *et al.* (51 I. C. C. Repts. 250, Oct., 1918).—Though the complaint was filed on March 6, 1917, this decision was concerned with rates that were increased in the general advance rate order (No. 28) of the Director-General, who became a party to the proceeding. The Commission decided that the latter event did not prevent it from exercising its powers to readjust rate structures involving undue discrimination, and that rates initiated by the President must also be reasonable in and of themselves. "There is no authority in the Control Act for perpetrating during the period of Federal control a rate adjustment that is unlawful under the Act to regulate commerce. . . . It is inconceivable, in our opinion, that the Congress did a vain thing in conferring upon this Commission power to determine whether or not the rates initiated by the Director-General are just and reasonable. The same force and effect must be given to that part of the law as to its other provisions. The simple fact is that if the rates were unlawful because unduly prejudicial when the evidence was submitted, the changes in rates since Federal control have increased the prejudice."

The Commission ruled that the rates on lumber and forest products from Willamette Valley points to various points in Montana, Wyoming, North Dakota, South Dakota, Nebraska, Minnesota, Wisconsin, Michigan and in the Canadian provinces of Manitoba and Saskatchewan are relatively unreasonable and unjust to the extent that they exceed rates maintained from the coast group, including Portland, Ore., to the same destinations.

2. The Shreveport Case (R. R. Commission of Louisiana *v.* Arkansas Harbor Terminal Ry. Co. *et al.*, 48 I. C. C. 312).—Upon rehearing the so-called Shreveport case the Commission held that its order of July 7, 1916 (*A. Y. B.*, 1916, p. 543), should be modified as regards certain commodity rates and as regards the application of the current Western classification to the transportation of freight between points in Texas. The Commission, however, refused to accede to the contention that its Shreveport order goes beyond the necessities of the case. The interveners granted the authority of the Commission to prescribe rates between Shreveport and Texas points but denied its power to displace Texas rates and classification provisions "except within the territory that is substantially tributary to Shreveport". The Commission held that "the area in Texas from and to which Shreveport may reasonably expect to ship freight embraces the entire state of Texas. . . . There are no transportation conditions justifying higher rates, distance considered, between Shreveport and Texas points than between points in Texas."

3. Illinois Passenger Fares Case (Business Men's League of St. Louis *v.* Atchison, Topeka & Santa Fe Ry. Co. *et al.*, 49 I. C. C. 713, May, 1918).—This decision likewise concerns the conflict of Federal and state authority in rate making. It is a supplementary report necessitated by a decision rendered by the U. S. Supreme Court on Jan. 14, 1918 (see *Leading Court Decisions, infra*). In order to come within the requirements of the Court regarding the need of more definiteness and certainty in prescribing rates which have the effect of changing rates established under state authority, the Commission confined its order to passenger traffic between St. Louis, Mo., East St. Louis, Madison and Granite City, Ill., and points within an area the boundaries of which are defined in the Commission's order.

4. In the matter of Private Cars (50 I. C. C. 652, July, 1918).—As the result of proceedings instituted in 1912 and subsequent investigation, the Commission rendered a lengthy report on private cars in which it finds that: (*a*) it is to the interest of the owners, carriers and public that the operation of private cars should be continued, under rules which will insure efficiency and avoid discrimination against particular shippers or kinds of traffic; (*b*) shippers should be permitted to lease cars from sources independent of the railroads; (*c*) charges in addition to freight rates should not be made for furnishing special types of cars unless the freight rates are based upon transportation in other types of cars less expensive and less difficult to operate; (*d*) payments by carriers should be based on loaded and empty mileage, computed without eliminating mileage through switching districts, (*e*) the mileage allowance on tank, live poultry, palace-stock and heater cars should be increased to one cent per mile; (*f*) tariffs should provide that owned or leased cars when unloaded at destination of the plant of the owner or lessee must be promptly routed in the direction of the plant of the owner or lessee, unless otherwise ordered by him; (*g*) carriers owning tank cars shall publish tariff rules under which each shipper requesting cars may receive a proportionate

share; (*h*) private cars standing on tracks of owners should not be subjected to demurrage charges; and (*i*) "re-icing charges on shipments of fresh meats, packing-house products, and dairy products should be based on the cost of the ice and salt used, the labor, investment in icing plants, etc., together with a reasonable profit; carriers should perform the service of re-icing and make the charges; and shippers of these products should not be permitted to perform the service of re-icing their own and competitors' shipments *en route*, either directly or through corporations controlled by them."

5. Private Wire Contracts (50 I. C. C. 731, Aug., 1918).—See *Telegraphs and Telephones, supra.*

6. Texas Midland Valuation (Vol. I, Rept. of I. C. C. 1, July, 1918). The Commission does not state a single sum as the value of the Texas Midland's property as the Act of 1913 ultimately requires it to do, but presents its findings as to underlying facts and grants leave to the parties interested to apply to be heard as to what sums based thereon shall be stated as the value of the property held for the purposes of a common carrier. In the lengthy report the methods used in ascertaining "original cost to date", "cost of reproduction new", "cost of reproduction less depreciation", and the several cost values are analysed.

The principles announced in the Texas Midland report were also followed in the Winston-Salem Southbound Railway valuation report. Various changes, however, were made in the tentative valuation of this line, and the final valuation is to be supplemented by further appropriate findings and order with respect to the value of the Company's common-carrier property.

7. Southwestern Class Case (48 I. C. C. Rept. 379, March, 1918).—Proposed increased rates between points in Oklahoma and Texas, between Oklahoma and the Texas Panhandle, which had been suspended until Dec. 1, 1917, and then had been voluntarily deferred until April 1, 1918, were ordered to be permanently cancelled because not justified; without prejudice, however, to the filing of tariffs conforming to the findings in the Commission's report.

8. Peddler Car Service Case (Swift & Co. *v.* Pittsburgh, Cincinnati, Chicago & St. Louis Ry. *et al.*, 48 I. C. C. Repts. 525, March, 1918).—The failure of the defendant carriers to provide a peddler car service for meats and packing-house products in less than car-load lots from Chicago and East St. Louis to various specified points was held to be unreasonable. A peddler car service was ordered and maximum rates were prescribed.

9. Industrial Railway Cases.—As in previous years, payments and allowances in connection with industrial railroads were the cause of Commission litigation. In 48 I. C. C. Rept. 620, for example, it was held that the Marting Iron & Steel Co.'s industrial tracks are mere plant facilities and are not entitled to allowances from the trunk lines for switching between points of interchange and final placement within the plant of the steel company. In National Tube Co. *v.* Baltimore & Ohio R. R. Co. *et al.* (50 I. C. C. Rept. 489) the Commission dismissed the Tube Company's claim for reparation due to the discontinuance of allowances, and the demands of the Carnegie Steel Co. were similarly dismissed. The Commission suggests that in view of the variance of opinion entertained in the Commission and elsewhere upon the many important and difficult questions so frequently arising out of the relations between the trunk-line carriers and industries with industrial railways, it seems desirable that the rulings in this case "should be reviewed by the courts in order that some definite principle may be judicially established by which we may hereafter be guided in such cases as they arise."

10. New York Harbor Case (Committee on Ways and Means to prosecute the case of Alleged R. R. Rate and Service Discrimination at the Port of N. Y. *v.* B. & O. R. R. Co. *et al.*, 47 I. C. C. Rept. 643, Dec., 1917).—The Commission denied the request that rates between points in the West and Jersey City, Hoboken, Newark, Paterson and other cities in northern New Jersey should be lower than the rates to and from Manhattan and Brooklyn. The contention that New Jersey points are unfairly grouped, that lighterage and floatage costs are not recognized, and that favorable location is disregarded did not convince the Commission of undue discrimination in the existing rate structure. The Commission held that blanket or group rates are in many cases of great advantage to the public without serious injustice to any interest, and that, once established, groups should not be unnecessarily disturbed. "If in the development of the rate fabric in the past years recognition had been given to the expense of the terminal services on both sides of the harbor, with a view to affording the carriers in each instance reasonable remuneration for the terminal service, it is not improbable that a more satisfactory and enduring rate structure would have resulted, and it perhaps will be difficult now to require the extension of the rail rates so as to include lighterage. But such has not been the history of the adjustment. Competitive forces that the carriers have not been able to ignore have exerted their influence and have had the effect of bringing to a common level most of the rates to and from this great industrial community. We are not prepared to say that the carriers' recognition of the competitive influences, resulting as it has in an equality of rates throughout the zone, is essentially unlawful. The violence that would be done to all interests by ignoring the growth and development of the rate structure and requiring a readjustment on technical grounds would be very great."

11. Proposed Increases in New England (49 I. C. C. 421, April, 1918).—Coming shortly before fares and freight rates were generally raised by the Director-General (see *supra*), this decision is of interest in that it contains the opinion of the Commission in regard to

charges in New England territory. The Commission authorized (*a*) the advance of class freight rates in accordance with two prescribed distance scales; (*b*) advance of local and joint one-way passenger fares to 2¾ cents per mile; (*c*) the sale of mileage tickets at the same rate per mile as one-way tickets or in carriers' discretion on basis of one-tenth or one-eighth of a cent per mile below the regular one-way fares; (*d*) the withdrawal of open and unlimited trip tickets; (*e*) the sale of 25-trip family tickets, limited to three months, on the basis of 2¼ cents per mile; and (*f*) party fares on a basis of 2½ cents per mile. The proposed advance of class freight rates by the Bangor & Aroostook and Canadian Pacific railways, on the contrary, was found not to have been justified.

LEADING COURT DECISIONS

The following are among the most important court decisions affecting railroads rendered since the last issue of the YEAR BOOK:

1. Illinois Passenger Fare Case (245 U. S. Repts. 493, Jan. 14, 1918).—While again upholding the power of the Interstate Commerce Commission to remove an existing discrimination against interstate commerce by directing a change in an intrastate rate prescribed by state authority, the U. S. Supreme Court declared the supplementary order of the Commission in the Illinois two-cent fare order invalid because of uncertainty resulting from failure to state a definite field of operation and to define the territory or points to which the order applied. The Commission has since then rendered another supplementary report with a view to embodying the principle of definiteness announced by the Court (see *supra*).

2. Missouri, Kansas & Texas Ry. Co. *e.g.* Texas *et al. v.* State of Texas (U. S. Supreme Court Advance Opinons 1917, p. 212, Jan. 14, 1918).—An order of the Texas State Railroad Commission requiring through interstate trains originating outside of the state on the lines of other carriers to start in the state at the point of origin and at local stations on schedule time with an allowance of not more than 30 minutes for connections was held by the U. S. Supreme Court to be an unconstitutional regulation of interstate commerce.

3. Northern Pacific Railway Co. *v.* M. J. Solum *et al.* (U. S. Supreme Court Advance Opinions 1917-18, p. 677, June 10, 1918).—The duty of a carrier to route by the cheaper of two routes is not absolute in the absence of specific shipping instructions. The obligation of the carrier is to deal justly with the shipper, and if, all things considered, it would be unreasonable to ship *via* the cheaper route the railroad is not compelled to do so.

4. Boston and Maine R. R. *v.* E. G. Piper (U. S. Supreme Court Advance Opinions 1917-18, p. 461, April 15, 1918).—It is unlawful for a live-stock carrier by agreement made in consideration of a reduced rate, and contained in its bill of lading, to limit its liability from unusual delay and detention caused by its negligence to the amount expended by the shipper on food and water for the stock while so detained. Such an agreement is an attempt to evade liability caused by the carriers' negligence and is not within the principle of limiting liability to an agreed valuation which has been made the basis of a reduced freight rate.

5. M. H. Smith *v.* Interstate Commerce Commission (U. S. Supreme Court Advance Opinions 1917, p. 46, Nov. 5, 1917).—The Interstate Commerce Commission has the statutory power to require the president of an interstate railway company to answer questions regarding supposed political activities and effort to suppress competition on the part of such company when they are incidental to questions as to how sums expended for these purposes were charged in the companies' accounts. The Commission may also inquire into the conduct of an interstate carrier and the expenditure of its funds for the purpose of moulding or enlightening public opinion. Such carrier cannot use its funds and powers in opposition to the policies of the Government on the plea that it is using them for the purpose of moulding or enlightening public opinion.

6. St. Louis Southwestern Ry. Co. *et al. v.* United States and Interstate Commerce Commission (U. S. Supreme Court Advance Opinions 1917, p. 60, Nov. 12, 1917).—In this decision the routing powers of Congress and the Interstate Commerce Commission and their power to establish joint rates is defined and upheld. It is declared that Congress has power to authorize the Commission to require through routes and joint rates in the place of existing joint rates, and the Commission has power to substitute a through route and joint rate to a designated city not higher than the rate to another city equally distant from the place from which the transportation begins, in place of a through rate made by adding the rate to the second city, which is a rate-breaking point, and the local rate therefrom to the former city, when the carriers are given the right to elect between establishing a new and shorter route or continuing the existing route, and the new joint rate is reasonable while the old rate is unreasonable.

XX. ENGINEERING

CIVIL ENGINEERING

FRANK C. WIGHT

General Conditions.—Civil engineering in 1918 became practically a war industry. Thousands of the members of the profession entered the military service either in the combatant troops or in the construction and maintenance operations here and abroad, and the restrictions on non-war construction were so great and universal as to leave little work for those who remained in civilian employ. Bare maintenance of existing necessities was continued and occupied a minority of engineers, but new construction was practically non-existent. The demands of the war on engineers and contractors, however, were so insistent that there was no lack of work either for designing or constructing engineers or for the manufacturers of construction material. Rather was there a dearth of competent men for the necessary work and a great shortage of material.

While engineers and contractors had no difficulty in finding work, as a rule they did not participate in the increased profits that were common to labor and the producer. Practically every engineer who entered military service did so at a pecuniary loss; nor was the remuneration of the directing heads of great war constructions at all commensurate with the increase to labor and material manufacturers or even proportionate to the increased cost of living. Some few contracting firms, by reason of the volume of work rather than the profits on any one job, came under the excess-profits clause of the new tax laws, but most engineers in 1918 were classed with the great body of salaried workers to whom the war has brought unprecedented financial burden.

Military Engineering. — That the war has been an engineering war is a trite remark. To most men, however, this brings to mind the huge and multiplied enginery of war, the tanks, the motor transport, the signaling, gas, airplanes, and, above all, the guns. All of these are the mighty tools of modern war, but they are all dynamic; they are the application of *mechanical* engineering to military science. Working with them, equally important though in no way as spectacular, are the static elements, the work of the *civil* engineer. The former facilitate the fighting of a battle; the latter are necessary to the conduct of a war.

In no other war, and in no part of the European War, have these civil-engineering activities played so important a part as in the months of American participation in the great conflict just closed. At the end approximately 2,000,000 American soldiers were in Europe. Great as was the feat of putting that vast army on the shores of France, it was equalled by the preparations to take care of them, and their necessary appurtenant industries, when once there. The full story of the construction of that year and a half must still wait, but three old French harbors, one hardly known or used and another distinctly third-rate, were transformed into modern docking and freight-handling terminals literally surpassing any similar facility in the United States; a main line railroad with about 850 miles of main track spur connections and side tracks, was built; factories of major importance were erected, equipped and manned; forestry and sawmill operations of unprecedented European magnitude were maintained; roads were built and cared for; and warehouses to store supplies for the whole expeditionary forces were put up—all by

American engineers, mostly men from civil life to whom a short year before a uniform was a spectacle rather than a covering. Entirely aside from the glorious record of the combatant engineer troops, the engineers of America have made military history in France that will take many pages in the future story of the Great War. (See also XI, *The Army.*)

Dams.—In a year conspicuous for its lack of large engineering failures or catastrophes, the slip of a considerable portion of the Calaveras earth-fill dam near San Francisco on March 24 is noteworthy. This dam, which was to have been the highest earth-fill dam in the world, is being built as a part of an additional water supply by the Spring Valley Water Co. of San Francisco. It had been under construction for some four years. It is a hydraulic-fill dam, that is, an earth embankment formed mainly by the deposition of earth water-borne through pipes from nearby clay pits. In addition, dry rock fill was freely used on both the toes, so that this heavier material formed nearly half the total yardage at the time of the accident. The dam is to be 210 ft. high above the stream bed and 240 ft. above bedrock. The high-water line was to be 20 ft. below the top, so that the greatest depth of water back of the dam would be 190 ft. It is 1,300 ft. long, with a total width on top of 25 ft. and slopes of 1:3 upstream and 1:2½ downstream, the total thickness of the bottom, due to berms, being 1,300 ft. The construction had reached a point about 40 ft. below the top when without immediate warning a section about 700 ft. in length and extending over about 60 per cent. of the upstream side of the dam slipped into the reservoir, which at that time had reached a depth of 55 ft. Previous to the failure, a number of ominous bulgings in the upstream face of the dam had been noted, but with some delays, purposely made to permit the liquid core to solidify, the work had been continuously carried on. While full investigation of the failure has not yet been made, owing to the difficulty of getting into the dam and studying the quality of the fill there, it is undoubtedly true that there were deficiencies in the type of clay used in the filling and in the speed of the filling, so that the interior core had so great a liquidity that it established a hydraulic head against the outer rock fill which that fill was unable to resist.

Remarkable similarity was remarked between this failure and the failure of the Necaxa hydraulic-fill dam near the City of Mexico, in 1909. This dam at the time was the highest hydraulic-fill dam in the world, being some 20 ft. lower than Calaveras. The Necaxa dam failed in precisely the same manner as Calaveras at exactly the same stage in its progress, that is, when it was 90 per cent. completed.

Buildings.—Building construction in 1918 was practically limited to war essentials. Up to September this was the natural result of the inability of prospective builders to procure building material because of its scarcity. In September the situation was accentuated by an order of the War Industries Board requiring a Government license for all building construction, and further prohibiting the use of any building material except for war essentials. Exceptions were made for structures already under way and for construction and repair costing less than $2,500. The machinery for the operation of this building-license requirement was quite elaborate. The War Industries Board deputized the various State Councils of Defense as the intermediaries between the prospective builder and the Government. Anyone wishing to purchase building material had to make application to his own State Council of Defense or similar body. If that Council considered the work necessary to the conduct of the war, it forwarded the application with approval to the War Industries Board, which then either approved it, in which case a license permitting the purchase of material was granted, or disapproved it, in which case the matter was closed. The State Council of Defense, however, had the power on its own initiative, to refuse to forward any application and while there was, of course, the right to appeal to the War Industries Board and even to the President, the judgment of the State

Council of Defense was rarely overruled. (See also XII, *Economic Conditions.*)

The outstanding feature of the building development of 1918 was the immense size of some of the structures. Up till this year, for instance, the largest concrete building in the United States was the Bevo Building at St. Louis, with something over 1,000,000 sq. ft. of floor area. In 1918 there was built in Washington a reinforced-concrete office building with 1,800,000 sq. ft. of floor area, and in several of the Army port terminals described below the floor area of one concrete building is as high as 2,500,000 sq. ft. The Equitable Building in New York, up to now the building with the greatest floor area, has about 1,800,000 sq. ft.

On account of the shortage of steel, most of the large buildings built, both for the Government and for private interests engaged in war work, were of reinforced concrete. The outstanding feature of their construction was the speed with which they were erected. The War and Navy Departments office building in Washington, which consists of a head house practically 1,800 ft. long with 17 wings extending back a distance of 600 ft., and which, although only three stories high, containing 1,800,000 sq. ft. of floor area, was built between March and September. The warehouses in the Boston and the Brooklyn Army bases (see IX, *Waterways and Harbors*), containing totals of 2,000,000 to 6,000,000 cu. ft., were put through in less than six months. In ordinary times the construction of such a building would take from two to three times as long. The speed was accomplished not only by profuse use of labor but also by careful planning, distribution of effort to different parts of the building, and perfection of construction methods. There is no doubt that the lessons learned in this speed-up of work for 1918 will be reflected in more rapid building operations in the future. While there is no claim that such speed does not cost money, a certain degree of rapidity can be accomplished with economy, and this being so, there is, of course, a great saving in capital investment in being able to take over a structure in a time shorter than hitherto.

Steel Ships.—Ship construction has absorbed many engineers and quantities of material which hitherto went into land structures. In previous years the civil engineer's interest in ships was negligible, being limited to the purely constructional side of the shipyard, the design of which was left to the naval architect, who was also responsible for the design and construction of the ships themselves. The Government's huge ship-construction programme, begun in the summer of 1917, required the services of the civil engineer, not only because the supply of ship specialists was far below the demand, but also because of the introduction into ship design and construction of new ideas initiated by men formerly connected with the structural-steel business and founded on the methods which have made American bridge and building engineers lead the world.

These methods primarily involved the careful detailing of all members of a structure so that no matter where the separate pieces were fabricated they could be put together in a perfectly fitted whole. This of course predicates a standardization of drafting-room system so that all shops, wheresoever they are located, can manufacture the article, and an accuracy of shop practice that guarantees the production of the article as designed. This stage of mechanical development had been reached in the bridge and building structural-steel industry and was readily transferred to ship construction, which before had been a one-plant business, that is, the fabrication and erection of the ship had all been carried out in one shop under one direction.

Further than this, the problem of erecting a steel ship was recognized as little different than the erection of a static steel structure and many of the methods used on land, but not yet accepted by the marine architect, were readily transferred to the latter's field. This does not mean that the old-line shipbuilder was thrust aside. Far from that. Everyone who knew anything at all of shipbuilding was pressed into service and his knowledge and experience combined with the, in many cases, superior practice of the structural engineer, with a resulting increase in production.

At the end of 1918 the new and old shipyards of the United States were working nearly to expected maximum production. Many of them were self-contained, that is, they bought only the plain plates and shapes and transformed them into finished ships. Many others were little more than erection shops where plates and frames fabricated at a dozen or more outside shops were put together on the ways. This has been the contribution of the civil engineer to the war ship programme, and it has played no small part in the wonderful production of ships noted in a subsequent article (see *Naval Architecture and Marine Engineering, infra*).

Concrete Ships.—In concrete ships, a radically new development, the civil engineer has been the moving spirit. Barges and lighters of concrete have been in limited use for a dozen years, but not until after beginning of the European War did a Norwegian engineer attempt a power-driven sea-going vessel of the material. This ship was only 300 tons burden, but it proved so successful as to turn attention to larger efforts. A number of engineers made tentative studies of big ships, but the real test came with the construction by San Francisco engineers early in 1918 of a concrete freighter, the *Faith.* This vessel, of 4,500 tons dead-weight carrying capacity, proved very successful in operation and wear, and has completed a voyage from San Francisco to Peru and back to the east coast of the United States.

Soon after the launching of the *Faith* the Emergency Fleet Corporation organized a Concrete Ship Department, which made a thorough study of the concrete ship, and following the Department's favorable recommendations, the Corporation let contracts for 42 large sea-going vessels, mostly of 7,500 tons capacity, and started the construction of five concrete-ship yards at San Francisco, San Diego, Mobile, Jacksonville and Wilmington, N. C. The first Government concrete ship, a 3,000-ton tanker, was launched at Brunswick, Ga., on Dec. 4, 1918. Meanwhile, the Navy Department, the War Department and the Railroad Administration let contracts for a number of concrete barges and lighters.

The concrete ship is still an experiment, for the test of time and wear has been applied to but one large vessel. It has, however, a promising future. Thanks to most elaborate government and private experimentation and study, it is now possible to produce a strong, water-tight concrete, probably safe against the water percolation which would in time rust the steel reinforcement and cause disintegration of the concrete. This concrete too, by use of an artificial burned-clay aggregate, weighs only 100 lb. per cu. ft. (as against 145 to 150 lb. for stone concrete), which permits a ship weighing only 60 per cent. of its carrying capacity as against 50 per cent. for a steel ship. The cost is considerably lower than a steel ship and the construction can be carried on by simpler labor, although more skill is required for concrete-ship work than its enthusiastic advocates at first claimed.

Ports and Harbors.—The enormously increased merchant marine of the United States has necessarily directed attention to the development of the ports of the country. If we are to have ships, we must have ports to handle them. In ocean transportation, as in all other transportation, the crucial economic element is the terminal. On it the financial success of a system depends. The port is the marine terminal, and as such it must have a mechanical improvement far beyond anything in this country in the past. Practically every sea-board city in the country, realizing this, has initiated studies of its port. So far none of these studies has resulted in actual construction, although Seattle voted $3,000,000 of bonds for new work which is about to start. In New York City a long needed joint commission of New York and New Jersey has received funds with which extensive studies of the interstate port there are being made. There seems a promise of a sinking of state jealousies for the good of the port. Philadelphia, Boston, Portland, Ore., San

Francisco and Los Angeles, among the large cities, are all alive to their futures as ports, but they are moving slowly. New Orleans has under way an ambitious project for a navigation canal and inner harbor connecting the Mississippi and Lake Pontchartrain. By means of a lock this will be kept at a fixed level, thus obviating the natural disadvantage of the wide difference in levels on the Mississippi.

The Federal Government is aiding a number of cities by the construction of Army depots which, while intended primarily for war needs, are so designed as to be of permanent value. In Boston and New York these terminals are far in advance of anything of the sort ever built. They consist of enormous concrete warehouses—the largest in the world, reached by railroad and motor truck and at the water edge connected to huge piers accommodating ocean vessels. These two terminals, together with lesser ones at Baltimore, Philadelphia, Charleston, S. C., Newark, N. J., Norfolk, Va., and New Orleans, should prove nuclei of something most needed in American ports, that is, efficient terminals in which overseas freight can be economically stored pending its economical transfer between ship and railroad or motor truck. (See also IX, *Waterways and Harbors.*)

Municipal Engineering.—A halt has practically been called in municipal engineering for the duration of the war. Only the barest maintenance necessities are continued, and in many cases even these have had to be omitted, to the great detriment of present and future conditions. Municipal engineers as a class have volunteered in great numbers for the engineer troops and for various engineering activities of the Army and for the developments required by the great war-industry plants. Materials for water supply and sewerage work has been quite generally lacking and municipal funds have been low. In consequence, there has been little activity in municipal construction and practically no new developments in municipal engineering design or construction.

One development of the war which has reacted strongly on municipal-engineering practice is the better utilization of garbage. More and more cities are providing some means whereby garbage is turned to a useful end rather than to burn it or bury it as in the not distant past. The U. S. Food Administration and the U. S. Army both devoted much attention to the study of garbage utilization. The Food Administration has made a report on the status of garbage disposal in the various cities of the country. In no less than 382 towns, with a combined population of nearly 30,000,000, garbage is being fed to hogs or fat and fertilzers are being reclaimed from it by means of reduction. In 315 cities of over 10,000, however, garbage is not being utilized but is being disposed of without benefit. In these cities there is a population of about 14,000,000, or about one-third of the 698 cities studied. Most of the larger cities have reduction plants, 18 of which are in cities of less than 100,000. Of the 315 cities which do not utilize their garbage, 102 use incinerating furnaces, while 214 report other methods of disposal. A considerable number of cities report feeding to hogs. Kansas City, Minneapolis, St. Paul, Denver, Providence, and Louisville are on this list. Among the cities which report incineration, four have populations of 200,000 or more, San Francisco, Milwaukee, part of New York City, and Atlanta, while these and eight others, or fourteen in all, have more than 100,000 population each. These 14 cities have a total population well towards 3,000,000. All are of sufficient size to support reduction instead of burning waste that might be reclaimed.

Miscellaneous Activities.—Bridges, roads, railways and hydroelectric developments can all be passed over in a single paragraph, not because intrinsically they have anything in common, but because in 1918 they received little more than maintenance. Practically no new work was done in any of these fields, and certainly no new technical developments in them are to be noted. Large needs for future work are piling up on account of the absence of the normal growth. In flood protection the great work in the Miami Valley above

Dayton, Ohio (*A. Y. B.*, 1917, p. 537), was continued handicapped by high labor cost and scarcity of materials. The Erie, Pa., flood protection made some progress, being considered as a war essential because of the many war industries that would be endangered by a repetition of the 1915 flood. A somewhat similar flood did occur on July 29, but it was very much less intense, and, thanks to protection work already done, did not cause appreciable damage.

The housing of war workers engaged many civil engineers and contractors. Two departments of the Government, one in the Shipping Board and the other in the Department of Labor, had appropriations of $110,000,000 to provide homes for workmen in war industries. Elaborate investigations of the needs of many communities were made, and where new houses were found imperative, architects and engineers prepared plans for groups of houses and frequently of whole towns, which as a rule were let as one contract job. In the larger developments, this meant a huge municipal engineering job, for it involved the laying out of the streets and lots and the design and construction of a whole municipal service system of water-supply, sewerage lighting streets, and in some cases central heating. Many of the leading engineers in the country served in this work. (See also VI, *Housing.*)

Inland Waterways. — From an engineering viewpoint the promises of the previous year (*A. Y. B.*, 1917, p. 536) were not fulfilled in 1918. Hopes had been expressed that the taking over of so many waterways by the Government would result in an immediate impetus to waterway transportation, particularly because railway opposition was theoretically no longer powerful. In fact inland-waterway transportation was practically non-existent, not because the waterways were not available or in proper engineering condition, but because the shippers would take no interest in the new systems, because terminals were not built, and because boats were not available. Engineers stood ready to provide what is necessary in the way of structures or carriers, but not until the end of the year was there any pronounced effort on the part of those who controlled funds to order these necessary facilities. (See also IX, *Waterways and Harbors.*)

ELECTRICAL ENGINEERING

C. D. FAWCETT

General Survey. — A great emergency has been successfully met by the electrical industries of the United States during 1918. The demands placed upon generating apparatus in central stations and isolated plants, combined with fuel shortage, scarcity of materials and labor, and congested transportation, have taxed the capacity of utilities and forced the consumer to employ every means to conserve power. Government control of the great telephone, telegraph and railway systems of the country has been adopted to coördinate the facilities of the individual systems. Through the War Industries Board the central stations, factories working under Government contract, and all electrical utility companies have been placed on a war-time basis under supervision of Federal officers. The American Institute of Electrical Engineers, the Illuminating Engineering Society, the National Electric Light Association, the American Electric Railway Association, the American Electro-chemical Society, and other national technical organizations have placed their facilities at the disposal of the Government. Through the acceptance of these offers trained men have been placed in positions of maximum service, power and manufacturing facilities have been greatly improved; and committees, coöperating with Federal boards, have solved engineering problems of great importance to the prosecution of the war and of lasting influence on the industry. Of particular interest is the coordination of effort carried out by the Engineering Council representing the leading technical societies.

The utilities of the country, laboring under the temporary demands of war activities, have experienced largely increased operating costs. Applications for increased rates have followed. State utility commissions have granted increases of from five to 20 per cent., almost without exception. Early in 1918 investigations covering a period of 12 months showed that 401 increases out of 462 applications of all public utilities for increased rates had been allowed. The increases included 68 per cent. of the railway applications, 91 per cent. of the telephone applications, and 82 per cent. of the electric-lighting applications; of these, however, only 16 applications were granted to railways, while 184 and 145, respectively, were granted to telephone and electric-light companies. (See also X, *Public Services.*)

Technical education has been temporarily influenced by the Government's action in taking over the control of the leading universities and colleges. On Oct. 1 some 150,000 students at more than 400 colleges were mustered into the Students' Army Training Corps to undergo an intensive training for a period of 24 months without summer vacations. Electrical courses have been changed by the emphasis placed on the study of telephony, wireless telegraphy, industrial applications, and other electrical subjects peculiar to military and naval needs. The Carnegie Foundation for the Advancement of Teaching has published an exhaustive study of technical education in the United States, in which is recommended a combination of technical theory in the schools and practical laboratory and special problem work in established private industrial plants. (See also XXX, *Education.*)

War conditions have induced beneficial influences tending to standardize types and sizes of various electrical apparatus and supplies. This will help to eliminate odd and expensive equipment, to reduce invested capital, and to economize in raw materials, all of which will result in a broader use of electrical devices. The central and isolated stations have increased, in general, their capacities by the installation of new standard generating equipment and more efficient auxiliary devices. Particular attention has been given to the elimination of non-essential consumption and effective application of power to industrial needs. A tendency toward greater adoption of automatic equipment has been noted.

The electric railways of the country have handled increased passenger and freight traffic problems with commendable judgment. In important industrial centers abnormal congestion has forced the adoption of skip-stop schedules and staggered hours of employment. Much additional railway equipment has been purchased and many new routes established. In the lighting field unnecessary energy consumption has been curtailed. In general, home lighting, display lighting and "white-way" lighting has been cut down by Federal request, and the lighting of industrial plants for purposes of increased production and protection has been extended. Lighting applications to war needs in this country and abroad have received special attention. Telephone and telegraph companies have accepted the burden of traffic brought on by Government control of industries and by the requirements of mobilization. This has been handled under adverse conditions of shortage of operators and overloaded lines. Long-distance transmission by wire lines and wireless has been used more generally. In only a few cases has it been necessary to curtail service in the United States, although public use of the cable and wireless services to Europe has been limited.

Research and invention has necessarily given way to intensive production. Laboratories of the leading electrical manufacturers and those under Government control have concentrated on the unsolved problems peculiar to the demands of a super-war. Industrial application of electrical apparatus to promote economical production has been the keynote of electrical progress during 1918.

The following tabulation gives the exports of electrical goods for the fiscal years ending June 30, 1917 and 1918; no radical change in the amounts of the various articles exported is to be noted, although the total is some six per cent. greater for 1918:

Articles	1917	1918
Batteries	$3,009,676	$3,351,838
Carbons	....	1,525,128
Generators	2,554,504	2,688,169
Fans	482,652	818,338
Heating and cooking apparatus	....	533,988
Insulated wire and cables	7,192,204	5,716,275
Interior wiring and supplies	1,123,664	1,532,309
Arc lamps	15,752	13,308
Carbon-filament lamps	157,413	144,761
Metal-filament lamps	2,143,802	3,183,021
Magnetos, spark plugs, etc.	....	3,167,325
Meters and measuring instruments	1,039,149	1,592,195
Motors	5,889,770	6,589,664
Rheostats and controllers	....	212,059
Switches and accessories	....	2,229,023
Telegraph and wireless apparatus	539,389	294,297
Telephones	1,953,504	2,566,929
Transformers	1,265,459	2,235,847
All other	24,536,885	16,123,996
Total	$51,903,823	$54,518,470

Central Station and Power Apparatus.—It has been estimated that the central stations of the country generate 8,500,000 h. p., and the isolated plants 4,500,000 h. p., a total of 13,000,000 h. p. The 1916 report of the Secretary of Agriculture gives 6,500,000 h. p. as the developed capacity of waterways, leaving some 6,500,000 h. p. generated by steam. It has also been computed that 60,000,000 h. p. from the streams of the country remains undeveloped, 40,000,000 being in 13 western states, and 6,000,000 being available from Niagara Falls. Some 2,402,000,000 kw.-hrs. per year closely represents the output from all sources.

These statistics, in the light of the diminishing fuel resources and increasing demands for power, point unmistakably to further utilization of water power and the economies to be attained by interconnections of existing central stations. An annual increased consumption of 100,000,000 tons of coal has resulted from the demands of forced production. This will no doubt diminish as peace conditions are established, but within a period of five years the normal consumption may be expected to require this additional tonnage. Federal restrictions and shortage of private capital have hindered hydro-electric developments. More liberal legislation should open the way for the needed power as capital is released from war industries.

The first seven-months' trial of "daylight saving," ended on Oct. 27, lowered the peak loads of the principal power-consuming centers from 10 to 15 per cent. This was an important factor in releasing capacity for other needs and the return to sun time has brought hardships to some large central stations. The following tabulation is typical of the average percentage distribution of power from four large central stations, and indicates the excess of war requirements:

	Per cent.
Direct war industries	73
Transportation	12
Municipal, commercial, residential	8
Commercial power, over 100 h. p.	2
Small commercial power	3
Non-essential	2

The tendency toward interconnection continued during 1918. In many cases it became necessary because of the concentration of industrial loads in new localities, shipyards, munitions plants, and mobilization centers being the principal new consumers. The principal districts covered were Pennsylvania, the New England States, North Carolina, Georgia, Tennessee, Illinois, Oregon, Washington and Texas. Additional reserve capacity, diversity of demand, saving in fuel, and sustained high load factors resulted.

Little increase in maximum capacity of generating units has been made in 1918 (see also *Mechanical Engineering, infra*). Thermodynamic efficiencies of turbines have reached almost 90 per cent. under present conditions. Experts have predicted higher degrees of superheat and pressures as the probable trend of development in the near future. A net gain of 10.45 per cent. in conservation of fuel would be attained by a superheat of 300° F. on the basis of an initial pressure of 250 lb. expanded to a 29-in. vacuum. This superheat and pressure are somewhat over the present general practice. Twenty-one of the leading manufacturers were affected by an order from the War Industries Board commandering all turbines over 700 h. p. on order or under construction.

Few departures from standard units have been noted in generator construction. Some very large induction apparatus has been assembled. A mammoth three-phase induction regulator rated at 1,000 kva., 10 per cent. regulation, 11,000 volts, 526 amp., weighing 23,000 lb., was completed for the Hartford (Conn.) Electric Light and Power Company. The Detroit Edison Company installed the largest polyphase transformer in America, a 50,000 kva. unit of 99 per cent. efficiency. The largest single-phase transformers ever built were put in operation during 1918—units rated at 8,000 kva., 25-cycle, self oil-cooled with 24 radiator sections.

The principal developments in auxiliary apparatus have been in the use of static condensers for power-factor correction at small isolated load centers, and the development of the metallic-electrode lighting arrester. The latter device, which has given excellent service under test, consists of a series of metallic electrodes and sheets of compressed lead peroxide separated by semi-insulating films of a lower oxide, all encased in weatherproof insulating tubes. Connections to the line are quite similar to the usual electrolytic-cell connections. On over voltages the new cell punctures and automatically restores the insulating film, but avoids the overheating and recharging experienced with the old type.

High-voltage transmission has progressed by the erection of several lines varying from 75,000 to 150,000 volts, but transmissions of 250,000 volts are still being contemplated. Stranded steel conductors, with reversed twist in the strands to avoid eddy currents, have been used at high altitudes on 30,000 kva. loads on voltages up to 40,000, thus reducing corona loss and mechanical weakness peculiar to copper lines. It has been demonstrated on Pacific Coast installations that cross arms and poles are protected from burning by metallic connection of the pins supporting the insulators, thus confining all electrostatic stresses to the insulators alone. Two standard types of outdoor substation have been developed. One type mounts low-capacity transformers and switch gear on wooden poles; the second type groups large-capacity transformers and switch gear on steel towers.

Automatic substations, used primarily for railway operation, have received unusual attention during 1918. These stations automatically start, synchronize, and stop the synchronous converters as demanded by traffic requirements. Careful selection and adjustment of relays controlling the switch gear and the protective apparatus installed are the chief requisites for successful operation. A 1,500-kw. portable railway substation, containing transformers, synchronous converter and auxiliaries, has been mounted on a car for emergency service on the Long Island Railway.

The bases of the expeditionary forces in France have required enormous supplies of power for lighting and motor loads. The Engineers Corps of the Army have handled all the intricate problems, involving the building of emergency transmission lines and substation and even additional central-station capacity. Some 150 miles of 30,000- to 40,000-volt lines have been built. It has been estimated that the power requirements at the end of the first year of war totaled 60,000 kva. The primary consideration was to make the power available with minimum delay. The French Government has given every assistance in this emergency.

Electric Transportation.—A recent investigation of the income of 388 electric railways, representing 63 per cent. of the electric mileage of the United States, showed a falling off in income of 82 per cent. for the first six months of 1918 as compared to the corresponding period of 1917. This was caused by abnormal traffic conditions and increased operating costs. The elevated and subway systems of New York City carried over 1,024,000,000 passengers for the year ending June 30, 1918, an increase of 39,000,000 over the preceding fiscal period. To meet the transportation needs much new equipment has been purchased and new track laid. In 1917, 900 miles of new and rebuilt track was placed in service; the figures for 1918, not yet compiled, will no doubt exceed this figure. New types of cars designed to handle rush-hour crowds with decreased operating costs have partially overcome traffic difficulties. The one-man operated cars for city service have made remarkably good records in the past two years. Skip stops have been inaugurated in practically all cities over 25,000 population, and staggered hours of employment have reduced congestion and lowered peak loads. One hundred street cars of a special heavy type were added to the Philadelphia Rapid Transit system to carry employees to the Hog Island Shipyard.

The low-fare taxi, or "jitney," operating in competition with street car lines has been reduced until only 6,000 were in operation in August, 1918, as compared with 20,000 in the preceding year. Some 21,000,000 gals. of gasoline represents the annual consumption of 6,000 "jitneys." The competition encouraged quicker transportation and more frequent service, this being secured largely through one-man cars at a reduction in operating costs averaging 35 per cent.

Remarkable economies have resulted in the operation of electrified railroad systems. Through the electrification of steam roads fully 50 per cent. increase in available capacity of existing tracks and other facilities have been noted, and train schedules have been shortened by 25 per cent. A recent estimate of the horse power of steam locomotives in the United States places the figure at 25,000,000, representing nearly twice the present total generating capacity of all electric stations. A saving of about 150,000,000 tons of coal per year would result through the substitution of hydroelectric power for the existing steam lines.

The Chicago, Milwaukee and St. Paul Railway continues to do pioneer work in long-distance electrification. A recent order included ten 266-ton locomotives having a one-hour rating of 4,000 h. p. and a continuous rating of 3,200 h. p., with a starting tractive effort of 112,000 lb. Six 1,500-volt twin motors drive each unit. The Seattle passenger extension of this line is equipped with gearless locomotives, a type which gave excellent performance on the New York Central lines. These units have a one-hour rating of 3,240 h. p. and a continuous rating of 2,760 h. p. with a maximum tractive effort of 55,200 lb. The Chicago, Milwaukee and St. Paul Railway secures its power under a contract based upon a load factor of 60 per cent. and an average value of power not to exceed 12,000 kw. over a five-minute period. Automatic control of fields of the substation generators governs train speeds and limit consumption in excess of this figure.

The great systems of the Pennsylvania and New Haven Railways terminating in New York City have been linked together by the electrification of a five-mile connecting line which includes a right of way across the famous Hell Gate Bridge. The feature of this installation is the locomotives which are equipped to operate from both the 11,000-volt alternating-current system of the New Haven and also from the 600-volt direct-current system of the Pennsylvania lines.

Material progress has been made in the high-voltage direct-current generating and switching apparatus, principally in the reduction of "flash-overs" and in extinguishing arcs at the switches. Insulating flash-plates between commutator sections and the internal flash-suppressor connection of direct-current armatures have proved effective. The latter device consists in the relay operation of three brushes which automatically short circuit the armature in three-phase relation through slip-rings whenever a short circuit occurs, the resulting armature reaction instantaneously (0.007 sec.) reducing the tendency to arc-over. A 3,000-volt, 3,000-amp., direct-current magnetic blowout circuit breaker, closing its main and auxiliary contacts under a pressure of 8,000 lb., has been put in operation on the Chicago, Milwaukee and St. Paul system. When tripped the contact separation is at the rate of 8,000 ft. per second.

Electric propulsion of ships continued to be the choice of the Navy Department for the newer battleships. The *New Mexico* recently was commissioned and the *California* and

Tennessee are being equipped with electric drive. The equipment of the latter is typical. It consists of four 7,000 h. p. three-phase induction motors wound for 24-pole and 36-pole operation with normal speeds of 123 and 180 revolutions per minute. Two turbo-generators rated at 13,500 volts and 15,000 kva. continuous overload supply the power.

Electric Communication.—The Government has taken over the supervision, possession, control and operation of the vast systems of telephone and telegraph companies, the estimated value of which is $13,000,000,000. The Bell Telephone System alone approximates 23,000,000 miles of wire in service and a total of nearly 11,000,000 stations in the United States. Government control was inaugurated on July 31, the date on which Great Britain took similar action exactly fifty years before (1868). The Postmaster-General of the United States was appointed executive head of the systems. Definite rate schedules and standard charges for installing or moving telephones were among the first problems undertaken by the new administration. (See also XIX, *Telegraphs and Telephones.*)

The following tabulation, compiled in 1918, gives the number and frequency of use of telephones for each 100 persons in several foreign countries and in the United States, together with the average weekly wage of employees:

	Number of Telephones	Number of Messages	Weekly Wage of Employees
United States	10.0	12	$10.50
Great Britain	1.5	3	6.50
France	?	3.5	4.50
Japan	0.4	19	?
Germany	2.0	4	5.00

The largest private branch exchange system in the world has been installed for the War Department at Washington. It serves approximately 4,000 stations and has 200 trunk lines, 17 private toll lines, and 105 tie lines to other Government stations in Washington. Some 35,000 calls per day are handled through this exchange. Hog Island Shipyard at Philadelphia has installed a system averaging 17,000 calls per day. These two systems are representative of the emergency traffic thrown upon telephone and telegraph companies in many centers of war activity.

The highest telephone line in the world has been put in service over Argentine Pass in Colorado. This is a lead line, supported on poles, at an altitude of 13,200 ft. The largest aerial cable, containing 212 pairs of wires, has been installed between New York and Albany. In general the research on telephone and telegraph devices has been confined to army and navy equipment, on which little information is available at this time. Early in December it was announced that the research telephone interests had perfected an improvement and an extension of the "phantom circuit" system whereby multiplex telephony, over existing wires, might practically be increased by 40 to 60 per cent. The automatic telephone system, in which the user makes his own connection with the party called, has advanced to a remarkable degree in 1918. Satisfactory service has resulted in practically all installations. Telephony continues to receive consideration as a substitute for telegraphy in train dispatching. This change has been adopted in many cases because of the shortage of telegraph operators. A telephone system for the transmission of instructions from the train dispatcher's office to the operators of moving trains has been successfully tried on the Canadian Government Railways. The printing telegraph, in which the message is automatically recorded on paper at the receiving end, has been installed by a number of companies. The speed and accuracy of receiving is not dependent upon the skill of the receiving operator.

Wireless stations controlled by the Government have enlarged their commercial importance and aided materially in the prosecution of the war. A powerful station having an operating radius of 4,000 miles was installed at Annapolis. Government headquarters at Washington and Army headquarters in the war zone have been in constant communication by wireless through several transfer stations. The chain of stations comprising Darien, San Diego, Pearl Harbor and Cavite (Philippine Islands) has been completed by the addition of the latter station in 1918. A receiving system that makes unnecessary the use of the exceedingly expensive high-tower receiving antenna and greatly reduces static disturbances has been invented by Roy A. Weagant, chief engineer of the Marconi Wireless Telegraph Co. of America, but the details are still withheld from publication.

Illumination.—In 1917 the lamp manufacturers standardized the sizes and types of gas-filled incandescent lamps. The year 1918 marks the standardization of industrial steel reflectors. This action will do much to improve the quality, efficiency and distribution characteristics of standard lighting units. Prismatic glass reflectors have been specially designed to give low cut-off to gas-filled lamps, thus minimizing glare from the high brilliancy of the sources. By the design of a special optical system and filament an incandescent lamp projector has been developed for motion-picture projection. These units are suitable for screens up to 14 ft. in width and from 80 to 90 ft. distant from the projector.

The Fuel Administration has curtailed display lighting and street lighting to some extent. Radical curtailment of the latter was tried, but because of the hazard from traffic and danger from evildoers and alien enemies the practice was discontinued. Reduction in home lighting has been encouraged by the Administration and generally practiced by the people. Few changes or new installations have been made in street lighting systems. The use of large capacity gas-filled incandescent units has been favored where new systems have been put in service. Industrial concerns have increased and improved their lighting equipments in a more extensive way than ever before. Enlarged production, decreased spoilage, and economies in labor and material have resulted. Protective lighting of yards, fences and factory buildings, to guard against menace from alien enemies, has been adopted upon Government suggestion. (See also X, *Lighting.*)

Production has, to a great extent, crowded out research and invention in the lighting field. Investigations have been conducted to determine the effect of wave form on the candlepower, life and efficiency of tungsten-filament lamps. Those burned on the sine wave showed a slightly higher candlepower and efficiency and a lower breakage than those operating on the peak wave. Additions of uranium and calcium fluoride in the electrodes of flaming-arc lamps have improved the color of the arc for photographic purposes. Arc machines for motion-picture projection have been given a steadier light by applying a coating of nickel over the copper plating of the negative carbon.

Many unusual lighting problems have been presented on the battlefields, chief among which are flare lighting for patrol protection or offensive operations; search lighting for discovery of hostile aircraft and marine purposes; search lighting for blinding the enemy when on the offensive; aircraft lighting, both in flying and landing operations; and the lighting of cantonments, dug-outs, trenches, artillery locations, etc.

Industrial Applications.—Manufacturers have been unable to supply the unprecedented demand for motors, electric furnaces, welding outfits and miscellaneous devices used in industrial plants. Motor drive has been applied on a great scale to the manufacture of chemical products, to sugar and flour mills, and to oil-well operations, mining, refrigeration and farming. Machine shops and many factories engaged in manufacturing war products have increased motor drive, replacing belt drives and other inefficient machinery. The chief chemical products in the manufacture of which electric power is consumed are aluminium, silicon, calcium carbide, cyanimide, ferro-alloys, graphite, carborundum, chlorine, and atmospheric nitrogen products. Mining applications include pumps, fans, compressors, locomotives, hoisting engines, cutting and loading machines. Many new installations have been made in ice plants and cold-storage houses during 1918. The use of electrical machinery on the farm lies chiefly in driving pumps, threshing machines, churns, hulling machines, etc. The western states have been especially active in the use of the electric drive in agricultural pursuits; California alone has an installed motor capacity of over 200,000 h. p. used on farms.

Heating devices of large capacity have been developed. It has been stated that the electric-heating load on central stations will eventually be greater than the motor load. The principal large heating devices used in industry are furnaces, welding equipments and baking ovens. Electric welding has been adapted to many difficult structural-steel problems involving the connection of plates, angles and tubes in shipbuilding, boiler manufacture and munitions manufacture. Repair work on 109 interned German ships was done by arc welding in less than 30 per cent. of the time allotted to the work (see also *Naval Architecture, infra*).

Motors for starting automobiles, magnetos, generators, gear-shifting devices, and all minor electrical accessories for both gasoline and electric vehicles have formed no small part of the output of electrical manufacturers. It has been estimated that over 4,000,000 automobiles were in operation in this country during 1918, and practically all of them have some electrical equipment.

MECHANICAL ENGINEERING

CALVIN W. RICE and LEON CAMMEN

Mechanical engineering in 1918 has had rather a checkered history, and one, moreover, which cannot yet be told in full. It was a year of great obstacles overcome and great results achieved. It was also in some respects a year of serious disappointments. Much of the work done—in fact, some of the most interesting achievements of American and foreign engineers, cannot yet be reported, because they comprise work done in the service of the military and naval branches of their respective Governments. But considering only what can be told, the year has been one of unusual importance.

Power Generation.—One of the most significant features in the field of power generation during the year was the continued tendency to construct larger and larger units. This tendency was evident in the fields both of steam-electric and that of hydroelectric plants. At Providence, R. I., a 45,000-kw. turbine was put in operation; it is of the Westinghouse cross-compound, double-unit type, high- and low-pressure sides each driving a generator of 22,500-kw. capacity. Still larger units are being installed in the Connors Creek Plant of the Detroit Edison Co. The original plan was to install six 25,000 kva. turbines, and three of them were actually installed between 1915 and 1917. But so rapid has been the development of steam-turbine engineering that when the question of installation of additional power-generating capacity came up in 1917, it was decided to double the size of the units and install two 50,000 kv.-amp. machines. One of these machines is now being placed. This turbine is of the disk type. It has 21 stages as against nine in the small machines, but is only 15 ft. longer over all than are the earlier machines with half the power capacity. The weight is only about 40 per cent. greater than that of the earlier models. To a large extent this small physical size in comparison with the early units is due to refinements in design, which have made it possible greatly to decrease the distance between wheels.

The same tendency towards greater and greater units of power-generating equipment is evidenced also in the field of hydroelectric plants. At the White River plant of the Puget Sound Traction, Light and Power Co., near Sumner, Wash., for example, two Francis turbines have been erected, each rated at 18,000 h. p. but actually capable of delivering about 22,000 h. p., which brings them into the class of the largest turbines of their kind in existence.

This increased use of extremely large units is of great importance in view of the apparent tendency towards the centralization of power generation on a scale that is likely to bring about the most profound changes in the economic structure of entire nations. The old fight between the central station and the so-called isolated plant serving a limited number of consumers, usually a group of consumers which can be supplied with current without having the lines led under or over public highways, seems about to enter an entirely new phase. The fuel-conservation methods to which the nations of the world have been forced to resort under the stress of tremendous demand for coal and decreased production through lack of man power and transportation facilities has caused a reconsideration of the whole subject of power generation. In England, in particular, the wastefulness of transportation of coal to the textile and other industrial centers and great cities, like London and Liverpool, has been realized more clearly than ever before, and a project is actually under way to burn all the coal, or as much of it as may prove feasible, in close proximity to the mines and transmit electric power at high voltages to the centers of use. This would mean the scrapping of every steam power plant in the respective districts and would result in reliance for power on immense central plants. Although the movement in itself is not new (in fact, a similar move, although on a less ambitious scale, was started just before the war in this country, namely, in the Lehigh Valley), the execution of such a project would bring great changes, not only in methods of production and in the location of industries, but also in the health conditions of the workmen and the general population in the vicinity of industrial centers.

It is clearly realized that unless the units of power generation are of tremendous size, and unless increase in the size of units brings about an increased economy in power generation, such a concentration of power production might not pay. Both of these conditions may be considered as having been already satisfied. The large turbine units of 30,000 to 50,000-kw. capacity have proved to be perfectly feasible and highly economical in operation. The question of the reliability of such large units, however, must be considered for the time being as open. In the last year there have been several wrecks of large turbine units, for example, besides well-known cases in Boston and Philadelphia, in August a 35,000-kw. turbine in Chicago; in September a 25,000-kw. turbine in Cincinnati and a 15,000-kw. impulse turbine in New Orleans; and in November a 45,000-kw. impulse turbine in Detroit. It is well to notice, however, that in none of these cases was there any very heavy loss of life or property, and that the turbines were put back in operation in a very short time. After the wreck in Cincinnati, for example, the turbine was in actual operation five days after the accident, and it could easily have been put back in service at least two days earlier had it not been deliberately kept open for the inspection of the engineers of the builders. It appears, therefore, that if a proper system of interconnection of generating plants is maintained and a proper reserve capacity is provided for, under all ordinary conditions the supply of power from a few immensely large stations located at or near the natural sources of energy, such as coal, oil, natural gas or water power, should be at least as reliable as with the present system of individual power plants.

Fuels.—In the year 1918 the world has been fuel-hungry as never before, and although conditions are likely to improve somewhat with the coming of peace, the demand for fuel is apt to be considerably in excess of the supply for some time to come. It was but natural that under these conditions there should be a wide search both for methods of better utilization of standard fuels and for the application of new materials to power generation.

The boiler plant of the William Penn Hotel in Pittsburgh is gas fired. Its design necessitated the solution of several nice problems, for example, simple and effective means for insuring the correct ratio between the quantities of gas and air. The question of baffling also involved certain difficulties; in fact, the first baffling, which was vertical, failed through the disintegration of the cement out of which the baffles were made, so that they had to be replaced by horizontal tubes.

Progress in the utilization of powdered coal continued during the year. A new system was placed on the market, in which the fuel is delivered from the pulverizing plant to the point of combustion by means of an air pressure, as distinguished from systems in which continuous helical screw conveyors are used or systems in which the coal is carried by high-velocity air as dust in suspension. The new scheme depends on the fact that powdered fuel when thoroughly dry acts as a fluid, and thus permits the use of piping of long lengths at practically any tilt or angle. Coal has been delivered thus over a distance of 1,500 ft., and four tons have been carried through a 550-ft. line in five minutes with air at 40 lb. gauge pressure.

The combustion of North Dakota lignites has been made a subject of special investigation by the U. S. Bureau of Mines. It was found that in an ordinary furnace with a horizontal grate this fuel was very difficult to ignite and burn. A special furnace was designed to satisfy the basic requirements of burning lignite and its carbonized residue, mainly with a view to its use in house heating. The results secured, however, cannot yet be considered conclusive.

An announcement was made before the American Institute of Mining Engineers that a new fuel known as "carbocoal" has been developed. The fuel is said to be smokeless; the essential features of its manufacture are two distillations carried on at different temperatures. First, raw coal is treated at a relatively low temperature of 850° to 900° F. which results in a product rich in carbon. This intermediate product is mixed with a certain proportion of pitch from the tar produced in the process and the mixture briqueted. The briquets are then subjected to a second distillation at a higher temperature of approximately 1,800° F., resulting in the production of "carbocoal." It is said that this second distillation is accompanied by a recovery of additional tar and gas and a substantial yield of ammonium sulphate. The advantages of "carbocoal" are that it can be made into small briquettes, is smokeless, and requires no more draft than bituminous coal, and at the same time permits the recovery of valuable by-products in the process of its manufacture. It has been announced officially that a plant is being erected for producing "carbocoal" for the use of the U. S. Government.

Thermodynamics.—An extensive investigation of the specific heat of water, covering a period of several years, is reported by W. R. Bousfield in a paper before the Royal Society. The corrected figures obtained were found to be closely in line with those of previous observers. They indicate that the mean specific heat from 13° to 26° is almost exactly equal to that of 26° to 39°, which gives the minimum value in the neighborhood of 25°. The new results are in general agreement with the curves of Luedin, Rowland and Bartoli and Stracciati, but differ from the course of the Callendar and Barnes curves. Such an investigation is of importance, because until the course of the specific-heat curve from 0° to 40° can be considered as definitely settled, there must remain a doubt as to the value of the 20° calorie, amounting to one part per thousand.

The subject of heat transfer has been studied from several angles. W. Nusselt, in an investigation of the heat transfer in tubes reported in the *Zeitschrift des Vereines Deutscher Ingenieure* (Aug. 18, 1917, p. 685), gave a formula for the mean coefficient of heat transference in a tube of given length, applicable either to the heating or the cooling of a gas, but accurate only when the temperature of the gas changes little along the tube.

Charles H. Herter, in a paper before the Society of Refrigerating Engineers, gave a comparison of the various values for the coefficient of heat transfer from air to pipes. It is rather interesting to note that various investigators gave values varying from one to 13 B. t. u. per hour per square foot of air contact surface per degree Fahrenheit mean temperature difference between air and surface for this coefficient.

The flow of heat through building materials formed the subject of tests at the Pennsylvania State College. It appears that in the case of power insulators, such as glass, practically all high resistance is to be found in the so-called surface resistance. It appears also that in spite of their entirely opposite insulating properties, corkboard and glass have very nearly the same value of coefficient of radiation and convection.

Steam Engineering.—A considerable amount of work has been done during the year on the design of steam turbines. Several investigations have been carried out on the behavior of the blading under the impact of the steam which have shown the best materials to be used in the high-pressure and low-pressure drums.

A French writer has investigated the conditions prevailing in the low-pressure end of large turbines. It is found that although the absolute velocity of the steam as it leaves every other disk may be high without inconvenience, because the energy which it represents is to a large extent recovered in the next disk, this does not apply to the case of the last disk, as there this velocity constitutes a loss, the value of which may be quite substantial. If the last disk could be given a proper diameter, more of the energy in the steam could be utilized, and the turbine could be built with a comparatively smaller number of disks. However, in that case, the centrifugal stresses in the last disk would be so large that it could not be built up of a single forging. To obviate this a rather novel construction of the last disk is proposed, based on the employment of shrunk-on collars on the hub, these collars being placed with a properly regulated initial compression.

An important investigation on the general theory of steam turbines has been published in *Engineering* by Harold Medway Martin. It was found on several occasions in investigating the performance of steam turbines that the weight of steam discharged from the nozzle was actually greater than that physically possible according to the accepted theory. At first this was attributed to the moisture in the steam, but this explanation was discarded when it was found that to bring this theory into accord with experiments would involve the presence of anywhere between 10 and 20 per cent. of moisture in the steam. Later on the anomaly was attributed to a fundamental error in the accepted theory of the efflux of steam, namely, that the expansion of wet steam proceeds under conditions of thermal equilibrium. Martin bases his theory on the assumption that steam is not only not in thermal equilibrium in the "saturated field" of Mollier, but is never in thermal equilibrium until the condenser is reached.

There has been a tendency in recent years to resort to higher and higher steam pressure. It is obvious, of course, that higher steam pressures would be economical in respect of consumption of fuel and size of apparatus used provided the piping of the auxiliaries could be made sufficiently reliable. In the past year, in the power plant of the Public Service Company of Northern Illinois, at Joilet, Ill., a pressure of 300 lb. at the turbine and approximately 325 lb. at the boiler has been used with a superheat of 225° F., or about 75 lb. higher than is common in modern stationary practice. Because of the density of the steam extra-heavy piping of relatively small diameter is used; all rigid construction is carefully avoided, and numerous long-radius bends are employed to provide for expansion.

A good deal of progress has been made in the field of power-plant equipment. The use of the immensely large generating units has raised many problems in connection with the design of auxiliaries of suitable size. Thus, in one instance, a surface condenser had to be provided to serve a 30,000-kw. turbine. In addition to its being a 50,000-sq. ft. unit, the great vertical distance between the condenser and the turbine entailed an extraordinary expansion in case the apparatus should be much changed in temperature. An ordinary expansion joint might not prove sufficient and therefore a special expansion joint was designed. It is 13 ft. in diameter, and consists essentially of a fairly close-fitting cast-iron sleeve, so formed as to permit a manometric column of mercury to constitute a seal to prevent air leakage and at the same time to permit of a free motion of the upper and lower halves of the joint relative to each other.

Another auxiliary that received a good deal of attention during the year was the air pump on condensers. As to this an important report was published by a subcommittee of the Northeastern Coast Institution of Engineers and Shipbuilders (Great Britain). This committee tested reciprocating air pumps working all-wet, wet-and-dry, etc., and two steam jets, and has come to the conclusion that the best results are secured by the use of jets, the vacuum in some of the tests approaching very closely that ideally obtained in the absence of air.

In a Middle Western plant individual all-steel horizontal tube economizers were used for the first time in this country. Their construction is similar to that of the Babcock & Wilcox water-tube boilers without the drum. The economizer is vertically panelled for three passes, the gases from the boiler entering at the front, and from the third pass rising vertically through the induced-draft fan to the stack. Water enters the economizer at the bottom of the rear header and passes through 396 four-inch tubes to leave at the top of the front header.

Increased thrift in the use of fuel led to the adoption of more and more heat-saving devices. A British trade paper describes an installation serving a 3,000-kw. turbo-alternator plant in which an air heater is provided for each boiler. These air heaters comprise 36 elements each, between which the hot gases of combustion flow from the boiler to the main flue. The warm air is drawn into and through each heater by a fan driven by an electric motor. It is said that an important fuel economy is secured.

The effect of different arrangements of baffles in boiler tubes upon fuel economy was investigated by Lieut. Wm. G. Eager. It was found that the results of operation depend quite essentially on the arrangement of the baffles, and that tests of the efficiency of a boiler plant with variable baffle arrangements might give quite variable results in many cases.

Internal-Combustion Engineering.—There has been very little progress of a technical nature in the field of internal-combustion engines. An investigation carried out at the Rolls-Royce works in England has thrown a good deal of light on the causes of exhaust-valve troubles. They were found to be due partly to improper design, and partly, if not mainly, to pre-ignition, which was found to be greatly increased by the amount of lubricating oil, or rather by the lack of it, in the combustion chamber. It was found also that the water circulation has a very important effect on the overheating of exhaust valves, and that it is possible to obviate this latter by increasing the rate of flow of water through the cylinder jackets.

As usual several attempts were made to design motors without the conventional poppet valves. A new sleeve-valve engine is said to have been developed in America by a Pittsburgh company for use on motor cars. In this engine there are two inlets and two exhaust ports to each cylinder. The sleeve is positively operated by a double toggle combination, one link of which is driven by an eccentric shaft rotating at half crank-shaft speed, and the other half by an eccentric shaft which is placed above the crankshaft and is operated by means of the connecting rod, so that it has an irregular annular motion. In England a cuff-valve engine has been built, combining to a certain extent the features of sleeve and poppet valves. In a detachable cylinder head are arranged annular inlet and exhaust ports, and both these rows of ports are covered and uncovered by the reciprocation of a broad but light ring, somewhat resembling a wide piston ring. The ring is just wide enough to cover both sets of ports with sufficient overlap to prevent leakage. It is split and tongued at one point of its circumference so as to make it elastic and to enable the compression and explosion pressures to press it tightly to the wall at the cylinder head.

In the search for engine fuels, in

view of the scarcity of mineral fuel oil, peanut oil is said to have been tried out on the large motorship *France* under ordinary sea-going conditions with quite satisfactory results.

Automobile Engineering. — Essentially, the conditions in the automobile industry during the year were unusually unfavorable to technical development. The engineering staffs of motor-car companies were depleted by the withdrawal of men into Government service. The companies were working at top capacity on Government orders, which did not permit any freedom of changes or improvements. Passenger-car production was cut down to the limit, and truck and tractor production was limited to the most essential uses (see also *Automobiles, infra*). Nevertheless, a certain amount of important work has been done, chiefly in the direction of adapting the motors to the use of heavier fuels, a problem of particular importance in tractors.

Numerous tests, both public and private (tractor tests at Harrisburg, Pa., and especially tests carried out by Prof. J. L. Mowry at the Minnesota Agricultural College), have shown that the use of kerosene in tractor engines is apt to result in crankcase dilution. Further, tests on aeronautical engines by the Division of Military Aeronautics and on motor-truck engines by the engineers of the Texas Oil Co. at the Nash plant have shown that there is a close relation between the amount of crankcase dilution and the temperature of the engine. In fact, it appears that whenever the temperature of the engine is below the point of distillation, certain elements in the fuel (that is, constituents of the fuel of which the point of distillation is below the temperature of the engine) will condense, and sooner or later get past the piston rings into the crankcase, in as far as they are not burned in the cylinders. Although several means have been suggested for obviating these difficulties, none of them appear to solve the problem in a commercially satisfactory manner.

In this connection attention may be called to the tests carried out quite recently by the Automobile Club of France, in which engines were desired to run on kerosene under very rigid, and not always practical, conditions of operation. Of all the engines submitted for the tests, only one, designed by Bellem and Brégéras, has completed all the tests in a manner satisfactory to the authorities of the Club. This engine, of which full details have not yet been published in this country, appears to have an atomizing device embodied in each of the cylinders.

There have been the usual attempts to apply the Diesel engine to driving motor vehicles, attempts which so far have not been satisfactory but which may be expected ultimately to give a workable combination. An arrangement was patented in Austria which represents an attempt to inject the fuel into the combustion chamber at variable pressure but with a constant position of the needle valve. The experimental installation consists of a three-cylinder, two-stroke-cycle engine, the operation of which necessitates the provision on the car of two steel flasks filled with air at 70 atmospheres pressure. An air compressor, of course, is provided as part of the engine. In the descriptions published in the German technical papers it is stated that the use of steel for the working cylinders of the engine results in considerable saving in weight, but no data are given as to the actual weight of the installation.

In Great Britain, where the cost of gasoline is comparatively high and where the fuel itself was practically inaccessible during the war, the steam truck still enjoys a considerable amount of popular favor. A six-ton unit has recently been placed on the market by an English concern, of particular interest because it runs on rubber tires but uses coke as fuel. The steam generator is of the vertical water-tube type, with tubes slightly inclined from the horizontal plane, and operates with a working pressure of 230 lb. per square inch. The generator is fired from the bottom by means of a chute. The driver merely removes the lid from the chute with his foot and allows a certain amount of coke to drop from the adjacent bunker into the firebox; it is stated that with this arrangement the level of the fuel is maintained within strict limits.

One of the most interesting developments in the field of passenger-car engineering is the use of a 24-valve, six-cylinder engine as standard equipment by a prominent American motorcar company. The 16-valve, four-cylinder engine proved so successful for certain uses that the adoption of the 24-valve system for six-cylinder engines for cars in which cost was not a serious consideration was but natural.

Aeronautical Engineering. — The very peculiar conditions of the year, during which practically all aeronautical development has been done for the Government under conditions of strictest military secrecy, make it difficult to present a clear view of achievements. In two directions, however, important progress is known to have been made.

In the first place, airplanes of increased speed and increased carrying capacity have been constructed. It is known that both in this country and in Europe planes (as yet experimental) are now available which under favorable conditions can develop a speed in excess of 175 miles an hour, a speed so great that only three years ago it was considered as being theoretically impossible. In a demonstration carried out recently a plane flew from London to Paris carrying a full-size upright piano; in another demonstration, a British machine manœuvred over London with 40 persons aboard. Plans are under way for constructing what would be a real aerial cruiser with from 3,000 to 5,000 h. p. in the propelling plant.

Considerable progress has been made also in the design of aerial propellers and methods of testing them. M. C. Stuart has developed a method of treatment, known as the specific-speed method, by which all problems in the performance or design of a group of geometrically similar propellers may be solved by the use of a single curve and a simple formula for the specific units. Prof. Morgan Brooks, of the University of Illinois, has offered a new theory of air-propeller action. It has been assumed hitherto that air is driven by a propeller with a velocity that does not exceed the product of the pitch of the propeller by its revolutions. Actual experiments have shown, however, that air may be driven backward at a velocity nearly twice as great as this product indicates. In other words, there is a superspeed action of propellers, and air, instead of being swept backward by the screw pressure, is driven back by precise reflection or batting action. The acceptance of superspeed action would give a basis for reconciling thrust and power values as derived from static tests with those of wind tunnels or of flight, a thing which cannot be done today. (See also *Aeronautics, infra.*)

Railroad Engineering.—The taking over of the railroads by the Government brought about not only unification of operation but standardization of operating equipment, especially rolling stock. This led to the development of 12 types of United States standard cars and six types of standard locomotives, in which a special effort was made to design units which would be applicable under all conditions in its class of operation. Whether this attempt succeeded or not it would now be premature to say. (See also XIX, *Railroads.*)

The tendency towards increase in the size of locomotives noted in previous issues of the *Year Book* was still in force, but it may now be questioned whether it has not reached its limit. The locomotives recently delivered to the Virginian Railroad are really so big that it is by no means clear in what direction they can be further enlarged. They have already reached the limit of width permissible, and the boiler has grown to such an extent as to come practically to the top of the smokestack. It is doubtful if a further increase would result in economies commensurate with the added cost of production.

The scarcity of steel together with a feverish demand for rolling stock led to the development of two novel types of hopper cars (Norfolk & Western Railway), one built entirely of wood, including the center sills and bolsters, and the other composite, both types being of 57.5 tons capacity. The design of the composite car is of interest mainly because iron castings are used quite extensively in the framing.

Mechanics.—Many interesting questions relating to the failure of structures under compression have been brought up by the study of the strength of airplane framework. These problems are all the more difficult of solution as in the desire to use stream-line shapes exclusively, the cross sections of airplane members are usually not circular, as is the case with structural columns, but of irregular shapes.

W. L. Cowley and H. Levy, in a paper before the Royal Society (London), attempted to solve problems relating to the strength of such a construction as a beam under end thrusts supported at intermediate points. They believe that there are two types of failure of a structure. On the one hand, the material of a member may rupture on account of the yield stress having been exceeded during the course of the loading; on the other hand, the loading may be such that the geometrical configuration previously existing can no longer be maintained even approximately. It is this second type of failure that has been particularly investigated. The conclusions at which the writers arrived are of great interest. Contrary to general assumptions, they state that the presence of a bay of Euler's critical length would not of itself involve failure, and the criterion of failure suggested is not the length of the bay but the production of infinite bending moments at the supports.

In a way this is a revision of one of the basic assumptions of the doctrine of material stresses. A still more fundamental revision of the same doctrine, in this case in its totality, has been undertaken by R. F. Gwyther in a paper published in the *Philosophical Magazine.* Gwyther bases his theory on the existence of nine virtual strains, or nine elements of mechanical stress, and on the assumption that the elements of a material stress are functions of the first differential coefficients of the components of some vector quantity—in other words, functions of some set of nine virtual stresses. The acceptance of the principles involved in the doctrine proposed by Gwyther would have the effect of removing the entire subject of stress from its accepted place in the theory of elasticity and of making it an integral part of the statics and dynamics of a rigid body.

The solution of problems of torsion in structures of such irregular sections as propeller blades, spars, airplane struts, etc., because of the complexity of these sections, cannot well be arrived at by the ordinary mathematical methods. At the same time it is very important to know the torsional stresses occurring in these parts, so as to be able to use the minimum amount of material. A rather startling method of solving such problems was developed at the National Physical Laboratory, England, by A. A. Griffith and G. I. Taylor. This method is based on the fact that the equations that represent the torsion of an elastic bar of any uniform cross section are of exactly the same form as those that represent the displacement of a soap film due to a slight pressure acting on its surface, the film being stretched over a hole in a flat plate of the same shape as the cross section of the bar. Hence, by making appropriate measurements of soap films, it may be possible to find the stresses and torsional stiffness of a twisted bar or shaft of any cross section whatsoever. An apparatus has been developed for this purpose, consisting of a spherometer for mapping the contour lines of the film so as to determine its distortion, and an auto-collimator for determining the inclination of the film.

This investigation has called increased attention to the whole subject of liquid films, such as are present in soap bubbles. A lecture by Sir James Dewar before the Royal Society on the manner of blowing soap bubbles and means for prolonging their life is thus of peculiar interest. The production of bubbles under high pressure and of chains of bubbles has also been discussed. It is of interest in this connection to note how modern engineering utilizes for its great purposes phenomena which in the past were known only as curiosities or formed the basis of toys for children. The spinning top has become the modern gyroscope, with its wide and important application in the stabilization of torpedoes and airplanes, and now the soap bubble is acquiring a growing importance in the determination of stresses in materials.

Hydraulics.—The subject of flow in channels with large expansion ratio has been investigated by R. Kroener in Germany, this investigation being a continuation of work commenced by Andres and Hochschild. It was found that the conditions of flow were quite frequently unstable, and in no case has the power-loss curve the cubic form that would correspond to the quadratic law of resistance; in fact, the curves secured are not harmonious among themselves, the losses being dependent upon the extent of the back-flow zone.

The lateral flow of water under low heads, and in particular the flow through a lateral orifice near the lower end of a container, has been investigated by Albert E. Guy. It was found that there was a very noticeable rise of the vein past the lower edge of the orifice, the angle at the edge being 54°. It was also found that very definite stream lines exist throughout the mass of water in motion in the container, which converge from all sides towards the orifice in the direction from the bottom to the sill. Neither of the above observations is in accord with the Bossut equation or the varying flow-head theory. Guy's investigation also indicates the possibility that the usual assumption that the pressure within a jet is atmospheric is erroneous.

In the last few years a method of measuring the flow of water by hydrochemical gauging has been developed. This method consists in injecting a certain definite amount of an easily soluble, stable chemical into the flow at one point and determining by quantitative analysis the amount of the chemical present in a unit of water at a certain point downstream so selected as to give the chemical time to permeate evenly the whole body of water. This method, as described by Floyd A. Nagler in a paper before the American Society of Civil Engineers, has recently been applied to the verification of the Bazin formula.

Standardization.—The year was a memorable one in the history of American engineering because of the unusually extensive application of the principle of standardization. National industries were short of labor even before this country entered into the war. Although the export trade and munitions manufacture kept the shops, mines and farms unusually busy in the three preceding years, the country failed to receive the three or four million hands that the immigration steamers would have delivered in normal times. This alone was enough to create a shortage of labor, and when there was added a further drain through the draft and the deflection of labor to the still more intense production of munitions and ships for the United States Government, the only way to maintain the increased production demanded was by resorting to the greatest possible standardization, decreasing the number of types produced and simplifying the jigs, tools and general machinery of production. Military necessity was particularly favorable to thorough standardization, because it largely eliminated the consideration of cost of production and entirely eliminated the consideration of the preferences of the market.

This latter is an element which it is especially important to bear in mind. In ordinary times and when working for a commercial market, a limit to standardization is placed by the preferences of the purchasers. A standardized product can be made more rapidly and costs less to produce than one that has not been standardized, but if the purchaser is willing and able to pay the extra cost of having incorporated in an article the features that he particularly desires to see in it, he can in ordinary times secure such a product. In the past year, however, the shortage of labor made it undesirable to allow the purchasers and producers of goods such a latitude of selection, and legal means, such as orders of the War Industries Board and similar organizations, have forced the producers to limit their output to a certain restricted number of types. (See also XII, *The Conduct of Business;* and XVIII, *Manufacturers.*)

War orders whenever possible have been given practically exclusively for standardized products. As a result products were standardized that had never been standardized before. The Liberty motor and the Army trucks belong to a class of products in which standardization was more or less natural, but in the past year attempts were made to extend standardization to products to which it was not thought applicable before, for example, standardized locomotives and standardized ships. (See *Naval Architecture, infra.*) This movement has met with no uniform joy throughout the industries. In regard to the standardized locomotive, it has been objected that it would not be equally economical, efficient, and, in fact, applicable throughout the country. It was pointed out, for example, that the so-called United States standard locomotive could not be used at all in certain parts of the country where it would not pass through certain tunnels.

In this connection a very significant act has been passed by Congress relating especially to a national standard of screw threads. A Standardization Commission is to be maintained, composed of the director of the Bureau of Standards, representatives of the Army and Navy, and members appointed by the Secretary of Commerce, nominated respectively by the American Society of Mechanical Engineers and the Society of Automotive Engineers. Although the bill imposes no penalty for failure to conform to the standards established, there is no doubt that it will act as a powerful incentive for manufacturers to accept the standards that have been adopted by the Government and will be enforced in Government contracts.

The making of engineering and industrial standards in general is now placed on a broad and more satisfactory basis. Representatives of the American Society of Civil Engineers, the American Institute of Mining Engineers, the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, and the American Society for Testing Materials on Oct. 19, 1918, organized as the American Engineering Standards Committee. By its constitution this Committee consists of three representatives from each of these five founder societies and three from each of the following Government Departments: Department of Commerce, War Department, and Navy Department. Any proposed standard submitted to and approved by the main Committee shall be known either as a "Recommended Practice" or as a "Tentative Standard", and when, in the opinion of this Committee, after approval by the sponsor society or societies, it has proved its suitability, it shall be known as an "American Standard".

Concrete in Mechanical Structures. —The use of concrete has made immense strides during the year, not only in building construction (see *Civil Engineering, supra*) and shipbuilding (see *Naval Architecture, infra*), but also in novel applications to mechanical structures. We may mention particularly the use of concrete in large machine tools. Two types of planers with concrete beds have been built for the purpose of planing the beds of large gun-boring machines for the Government. In one of these planers the bed was designed like a huge concrete girder intended to support a load. A large percentage of steel reinforcement was used with a view to avoiding any possibility of the bed's settling at any point and destroying the alignment of the ways. The bed is 184 ft. long, 17 ft. wide at its widest part, and 18 ft. from the bottom to the top of the housing. It would have taken many months to construct such a machine from the usual materials. The use of concrete permitted completing the construction at the end of February, 1918, notwithstanding the fact that work was begun only on Dec. 24, 1917.

According to San Francisco papers another rather startling application of concrete is under consideration. The Union Iron Works of San Francisco is considering the construction of a concrete boiler. It is stated that the idea is to use for the boiler shell two thin sheets of steel, probably 0.25 in. in thickness, fastened together, with the two or three inches of space between them filled with high-grade cement. It is not stated with what pressure this boiler is to be used.

AERONAUTICS

JOHN H. DE KLYN

Aeronautics was divorced from the Signal Corps in April and two separate departments were established to carry the aeronautical programme into effect. The Division of Military Aeronautics, under Major-Gen. Wm. L. Kenly, decides on the suitability of types for military use, tests new types, and directs the necessary changes to render the machines effective. The actual prosecution of aerial warfare also comes under this branch. After machines are pronounced correct in all details, they are put into production under the direction of the Bureau of Aircraft Production. John D. Ryan, a man of wide business experience and great executive ability, was made Assistant Secretary of War and placed in charge of the production programme. At the cessation of hostilities bombing, training and scout planes were being produced, with every prospect that under the new organization the aerial programme would be well in hand by the early spring of 1919.

The Navy Department has been remarkably successful in obtaining proper production, and this has undoubtedly been aided by the establishment of the Naval Aircraft Factory at Philadelphia, which is both an experimental and a production plant. In England the Royal Flying Corps and the Royal Naval Air Service have been placed under a single head, but similar action has not appeared necessary in this country. (See also I, *War Organization.*)

Technical Progress. — During the year there have been no radical changes in airplane or dirigible design. Refinement in design and increase of power have been the principal factors in improving performance.

German airplane design embodies certain features which are distinctive in that they are almost universally customary with the enemy while used to only a small extent in Allied planes. Some of these features are unquestionably improvements, the majority, however, being necessities due to scarcity of materials. Steel is used for a large number of parts, such as longerons, wing spars, control-surface framing and landing carriage, and struts, either in tubes or structural forms. Plywood is practically always used as a body covering, either over steel or wood truss members or in the monocoque form braced by transverse bulkheads. The use of plywood and steel eliminates a good deal of waste lumber, as only a small percentage of wood cut can be used in airplane construction. Wood is frequently used in spars in the form of built-up sections instead of the conventional solid I-beam. Radiators are mounted in, above or just below the upper wing. Cooling is accomplished in the latter case by direct air flow; in the former the flow is due to difference in pressure between the upper and lower surfaces of the wing. These radiator positions allow of a well streamlined body, and although the upper portion of the engine is exposed, the practice of placing engine cylinders in line cuts down the resistance and a certain amount of cooling is thus effected. Balanced control surfaces are used even on small machines where their need is not apparent, and scouts having biplane tails have been captured. To a large extent, the large dihedral angle and swept-back wings formerly typical of German machines have disappeared; the washed-out wing reminiscent of the Etrich Taube, however, is still in vogue. Ailerons are usually used only on the upper wings, and their tips are set at a small negative angle. The factor of safety of German planes is smaller than is considered permissible by Allied engineers.

Engine standardization is more common with the Germans than with the Allies. It is estimated that between 60 and 70 sizes and makes of engines are being built in England. France is second with between 30 and

40, while at least four are in quantity production in this country. German engines, with but two exceptions, are of the same general type, having six cylinders in line, usually with four overhead valves in each cylinder. The Benz, Mercedes and Maybach, varying in horse power from 160 to 300, are the standard German engines. One rotary engine similar to the Gnome is used, and the 240 h. p. Mercedes has eight cylinders in line.

Bombing machines rapidly increased in number and proved very effective weapons. Three German bombing airplanes were used, the Friedrichshafen, the A. E. G., and the Zeppelin. The German bombers which have been brought down were invariably equipped with parachutes. The Handley-Page and the Caproni bombers are both in production in this country, and the Navy Department continues to develop large flying boats for submarine patrolling and bombing.

The most recently-developed small enemy triplane is the Fokker, in which the landing-carriage axle is streamlined in aerofoil shape, giving additional lift. In the same size the English have developed the Sopwith triplane, and the Italians the Caproni. It is to be noted that the most recent Fokker has reverted to the biplane form.

In the propeller field a fairly satisfactory variable pitch propeller has been developed, giving a more constant engine speed at various altitudes, better rate of climb, and higher ceiling than the conventional type of propeller. The use of various materials, notably steel, for propellers has been the subject of a large amount of experimental work. There has been a movement to use the normal-sized engine instead of going into enormous powers in a single engine. This is sometimes accomplished by mounting two engines back to back and using two propellers, one a tractor, the other a pusher, in series. The rear propeller is working in the disturbed air in the wake of the forward propeller. Until a more careful study has been made of the subject, a loss of efficiency may be expected from this arrangement.

In accordance with advices from abroad indicating the need of heavily powered engines, only the 12 cylinder Liberty motor was put into production in the United States. This is a 5 x 7 V engine with the cylinders set at 45° to reduce head resistance. The production engine with ignition system and propeller hub weighs but two pounds per brake horse power, and is an unquestionable success.

The most marked advance in airplane performance will undoubtedly come from the development of a super charger, that is, some method of maintaining constant engine charge weight at all altitudes.

The general tendency in marine flying has been to discard the hydro-airplane in favor of the flying boat. The twin-float system increases lateral stability on the water; in a rough sea, however, the floats are subjected to pounding. The single-float system has the advantage of decreasing resistance, but lacks lateral stability on the water unless the motion of the water is regular. A well streamlined flying boat presents little additional resistance over that of a hydro-airplane, is quite seaworthy, and is an ideal structure for carrying fuel and oil, crew and armament.

In airships the greatest changes have been in the non-rigid types. The principal departure, which has been in the blimp type, has consisted in bringing the car close to the hull and mounting the engine on a structure aft of the car. The failure of the Zeppelin as a war machine has been recognized, although it may be a strong factor in commercial work, as its carrying capacity has been increased to 17 tons over and above the weight of the crew, fuel and oil for a flight of 1,000 miles at 50 miles an hour. Unless a very strong wind is blowing, there is small danger in case of engine stoppage, which at the present time constitutes a serious menace in night flying of airplanes.

Three new wind tunnels are under construction or completed in this country; one at the Bureau of Standards, Washington, one at the Troop College of Technology, Pasadena, Cal., and that of the National Advisory Committee for Aeronautics at Langley Field, Va.

On account of war conditions, no

aeronautical exposition has been held during past year, and original development in this country is under a strict military censorship. Development in aeronautic design in other than European nations has been slow. The Japanese, however, have held an engine contest for native designers, which, while not disclosing any successful types, demonstrates a growing interest in the art. In the same country a stable airplane has been developed which is shaped like the Dunne but possesses tail surfaces.

Military Aeronautics.—It is now recognized that three general classes of machines are necessary to carry out successful aerial operations in warfare, and during the year these types have been more sharply defined than heretofore. The reconnaissance type is a general-utility machine used for strategical reconnaissance, artillery spotting, photography and short-range bombing. Machines of this type are usually two-seaters equipped with two guns, and carry bombs, camera or radio set. The scout or pursuit class consists of fast one-seaters, generally mounting two guns synchronized to fire through the propeller. Their duties consist in acting as escort to the slower reconnaissance machines, which, although armed, lack the maneuverability of the scout; in engaging enemy pursuit and observation machines; and in ground harassment. The long-range bombing machines have grown to enormous sizes. As the name implies, they are used on bombing raids far behind the enemy lines and have carrying capacity for large weights of bombs. They have two or more engines, three or more guns, and are capable of carrying a crew of five or six. Improved sighting devices have raised bomb dropping from a mere chance to a high degree of accuracy, and seaplanes have thus been made an effective weapon against the submarine.

The rarefied air at the high altitudes at which military machines are forced to fly has necessitated the determination of the aviator's endurance under such conditions. This is accomplished by subjecting the prospective flier to a physical test in a chamber from which the air may be exhausted. Oxygen respirators are frequently carried on high-altitude machines.

Some idea of the magnitude of aerial operations in the war may be gained from the fact that during the year ending June 30, 1918, the Royal Air Force operating on all fronts destroyed or shot down out of control 4,000 enemy planes. During September an average of 45 tons of bombs was dropped in Germany daily, and 36 raids a week were carried out by the British airmen on the west front alone. In three months 199 raids were made on Zeebrugge, Bruges and Ostend. Forty aero squadrons have been authorized in the United States, and 260 overseas, averaging 150 men, whereas initially at the time of the Mexican Border trouble the Army had in service about 12 airplanes. From the beginning of the war until September, 1918, the Germans made 47 raids on England by airship and 30 by airplane.

During the campaigns of 1918, since the development of open warfare, the value of the airplane increased by reason of reporting enemy movements to the tanks and cavalry, who work far in advance of the infantry, and in maintaining contact between all advanced positions and headquarters. Supremacy in the air resulted in blinding the foe by preventing their reconnaissance patrols from crossing the lines and by the destruction of enemy observation balloons. The use of the airplane as a fully developed military arm has been adopted even by China, where airplanes were used to assist in quelling a rebellion in the Province of Hunan.

Armored airplanes were used by the British and then discarded, as the additional weight carried was not thought justified by the protection afforded. One of the most recent German machines shot down was armored around the cockpits.

Industrial and Commercial Development.—Some idea of the magnitude of the present airplane industry (see XVIII, *Manufactures*) in this country may be gained by a consideration of the amount of spruce used and the size of personnel engaged in getting this lumber out. The Signal Corps organized a Spruce Production Division which on April 1, 1918, comprised 10,000 to 12,000 officers and enlisted men and 62,000 civilians. Eleven million feet of spruce suitable for airplane construction was required per month, which entailed the cutting of 1,100,000,000 ft. of lumber of all kinds (see also XVI, *Forestry*). A cut-up plant, 348 ft. by 400 ft., was erected, with a capacity of from 400,000 to 600,000 ft. of airplane stock in 24 hours. The Signal Corps further had 13,000 acres of castor beans for castor oil for engine lubrication under cultivation in Texas and other States (see also XVI, *Agriculture*).

As in other industries, war conditions have necessitated substitutes in the aeronautic industry. On account of the scarcity of linen a satisfactory substitute was sought, and the result was a cotton fabric of acceptable properties.

The planning and development of airplane mail service and the success in general attendant on the establishment of such routes give promise of a large commercial aeronautic development after the war. A mail service between New York, Philadelphia and Washington was inaugurated on May 15. The route was initially operated by the War Department but was later transferred to the Post Office. The route was so successful that on July 15 mail rates were reduced eight cents on the first ounce and 16 cents on the second ounce. Some items of operation averaged for June and July are good indications of monthly performance: total flying time, 186 hours and 22 minutes; miles flown, 14,378; cost per hour, $53.46; cost per mile, $3.84; miles per gallon of gasoline, 4.8. The average time between Washington and Belmont Park, with a stop at Philadelphia, is about three hours for the distance of 230 miles. A service between New York and Chicago is under contemplation and will soon be in operation. Mail services are in operation abroad between Continental Italy and Sardinia and between Paris and St. Nazaire. Routes are contemplated between Paris and Nice, Italy and her African colonies, and Norway and the British Isles.

A flight across the Atlantic is pretty well recognized as being only a matter of time, and will undoubtedly be accomplished when attention can be drawn from war work. The South American countries are recognizing the future of aviation, and both Brazil and Argentina have aviators training at home or abroad. Unique uses of airplanes are as ambulances at nearly all the American aviation fields, and by the Canadian Government as forest fire patrols.

Records and Flights.—Long flights are a custom rather than a rarity in present-day aviation, and new records are made almost daily. Early in the year Caleb Bragg was awarded the Curtiss Marine Flying Trophy for 1917 for flying from Port Washington, L. I., to Troy, N. Y., on Oct. 26, 1917. The distribution of Liberty Loan literature during the flight was a notable feature. Bragg in 1918, carrying one passenger, flew from McCook Field, Dayton, Ohio, to Bolling Field, Anacostia, D. C., a distance of about 430 miles, in three hours and five minutes. J. H. Yelle with passenger made the remarkable endurance flight of nine hours and 53 minutes on March 28. Katherine Stinson, flying from San Diego to San Francisco, 610 miles, in nine hours and ten minutes, held the record for women for the year. A pathfinding flight for the contemplated mail service between New York and Chicago was made in the actual flying time of ten hours and five minutes, stops being made at Cleveland and Bryan.

On Sept. 18, Capt. R. W. Schroeder, flying from Wilbur Wright Field in a Bristol fighter equipped with a 300 h. p. Hispano-Suiza engine, broke the world's altitude record by climbing to 28,900 ft. This is the first world's altitude record captured by an American since 1911.

Abroad, long flights for bombing raids are constantly being made, and several times during the year the crossing of the Alps has been accomplished. The first Australian record of note was made in a flight from Sydney to Point Cook, Melbourne, and return. The return flight of 600 miles was made in seven hours and 20 minutes, including one stop. A flight across the Sahara Desert was made by three French airplanes. The route was from Ourgla to Salah with a stop at Inifel, and the flight was accomplished in seven hours.

Notable flights in the lighter than air class were made in both balloons and dirigibles. A balloon flight of about 550 miles from Fort Omaha to Sartell, Minn., was made with five passengers in nine hours and 15 minutes. The first airship flight across the Mediterranean was made by the French, following a route from Paris to Aubagne to Algiers. The time of flight was 11 hours. A blimp record was made by Ensign P. J. Barnes, who remained in the air 30 hours and 30 minutes.

Publications.—During the year a large number of instruction books for pilots and mechanics have appeared. Among these may be mentioned *How to Fly*, by Capt. D. Gordon E. Re Vley; *The Eyes of the Army and Navy*, by Flight Lieut. Albert H. Munday; *Military Observation Balloons*, by Emil J. Widener; *Aircraft Mechanics' Handbook*, by Fred H. Colvin. The revised edition of *Military Aeroplanes*, by Grover C. Loening, while containing a section on piloting and rigging, is most valuable as a design treatise. *Dyke's Automobile Encyclopedia*, by A. L. Dyke, and *The Gas Motor*, by Max Kushlan, add to the knowledge of internal-combustion engines which may be applied to aeronautic engines.

A second new class of books is largely narrative, dealing with the fighting of the aerial forces. *Glorious Exploits of the Air*, by Edgar Middleton, *High Adventure*, by Capt. James Norman Hall, and *Cavalry of the Clouds*, by Captain Allen, are the leading examples of this class of literature. *D'Orcy's Airship Manual*, by Ladislas d'Orcy, *All the World's Aircraft*, edited by C. G. Grey, and *Aircraft in War and Commerce*, by W. H. Berry, fall in the statistical and descriptive class. It is not possible, of course, to bring books of this nature up to date until the war is over.

Several technical articles of value in the propeller field have been published. "The Characteristic Coefficients of a Propeller and Some Methods of Plotting Them," by E. P. King (*Aeronautics*, Jan. 2, 1918), is, as its title implies, a deduction and summarization of propeller coefficients and their graphical representation. In "Notes on Race Rotation in Screw Propellers" (ibid.), M. A. S. Reach has made a further advance in propeller theory by recognizing and formulating the loss of pressure necessary to maintain a rotational race column. "Air Propulsion," by Morgan Brooks, read before the American Society of Mechanical Engineers, is a new theory of propeller design, considering the action of the air on the blade as a direct impact and rebound instead of a flow, as in the aerofoil theory (see also *Mechanical Engineering, supra*). The paper has been widely criticised, and experimental proof of the theory is lacking. "Conventional Propeller Calculations," by F. W. Caldwell (*Jour. Soc. Auto. Engrs.*, August, 1918), outlines an empirical method of propeller design; interesting pictures of steel-propeller failures are included, and a theoretical consideration of airplane performance in connection with a variable-pitch propeller is presented, with some conclusive experimental results. "Experimental Research on Air Propellers," by W. F. Durand (Third Annual Report of the National Advisory Committee for Aeronautics), furnishes data on what is probably the most complete set of model propeller tests ever made. Forty-eight propellers, covering in general the modern field of design, were tested. The extreme value of the results rests in the fact that the characteristics were varied regularly. Working formulae are given and the application of the Eiffel logarithmic diagram made more universal by including a density scale for altitude correction. The application of the theory of kinematic similitude to model propeller tests is included, with a definition of the limits within which this application may be safely made.

As the report of the Advisory Committee is practically the only collection of scientific reports being published in the field of aeronautics at this time, much interest is attached to its contents. Among the more pretentious reports are: "Meteorology and Aeronautics," by Wm. R. Blair; a translation by Karl K. Darrow of the German mathematical and experimental research, "The Stretching of the Fabric and the Deformation of the Envelope in Non-Rigid Balloons"; "An Investigation of the Elements Which Contribute to Statical and Dynamical Stability," by Alexander Klemin, Edward P. Warner and George M. Denkinger; "The Gyroscopic Particle" and "The Gyroscopic Three-Dimensional Body," by A. F. Zahm; and the second report on "The Theory of an Airplane Encountering Gusts," by E. B. Wilson. Minor reports include tests of cotton airplane fabrics, a description of the means used to test airplane engines for performance at various altitudes, and preliminary investigations on radiators and spark plugs made at the Bureau of Standards. The aeronautic nomenclature has been revised and conversion tables useful for designers have been inserted.

Another treatise on the atmosphere, *The Principles of Aerography,* by Alexander McAdie is a further aid to aviators. Georges de Bothezat, the Russian authority, has made several contributions to aeronautic literature through the pages of *Aviation,* the most important of these being "Limit Performance of Airplanes" (*Aviation,* Oct. 1, 1918.)

"Some Outstanding Problems in Aeronautics," read by W. F. Durand before the Aeronautical Society of Great Britain, indicates clearly the lines of least resistance in future development. "A Comparison of Aviation Engines," by Herbert Chase (*Jour. Soc. Auto. Engrs.,* August, 1918), is well illustrated with cuts of modern airplane engines and is of exceeding interest to the engine designer. *Aeronautics,* by Cowley and Levy, members of the National Physical Laboratory Staff, is one of the most authoritative books yet published on the purely scientific aspects of the subject. This is no doubt due to their close contact with the valuable research work being carried on in England.

Several of the periodicals continue to give excellent descriptions of German planes and engines, and recently reports have come from German sources of Allied machines. The British Advisory Committee has published several reports showing the general trend of progress, but no detailed results are available to the public.

AUTOMOBILES

JOSEPH A. ANGLADA

The Automobile Industry.—During the year 1918 there have been no radical developments in the automobile business, due largely to the wartime restrictions placed on the manufacture of passenger cars by the Government. Truck production also was greatly limited, although before the entrance of the United States into the war it was greatly stimulated by war conditions and plans for the year 1918 were on a greatly expanded basis. Through the action of the War Industries Board, due to the shortage of iron, steel and other materials, the truck manufacturers were limited to approximately the same rate of production for the last half of 1918 as during 1917, when the 12 months' output was 128,157.

It has been shown that the automobile industry as a whole contributed more toward the winning of the war than any other peace industry of the country except steel manufacture. As the third largest manufacturing industry it took on more than $1,000,000,000 of war orders, including Liberty engines for airplanes, many thousands of motor trucks, officers' cars, trailers, tanks, ambulance bodies, shells, etc. In this war of motors—on land, on water and in the air—the automobile industry has been absolutely indispensable. It has contributed more important personnel to the military programme than any other industry, including hundreds of technical men, such as mechanical engineers, metallurgists, chemical engineers and production managers, many of whom have been commissioned, and thousands of chauffeurs, repairmen, etc. Seven thousand mechanics were sent to France by June to serve in the air service. Even in the aviation field the personnel was drawn largely from the automobile industry, including the leading American ace, Eddie Rickenbacker, who was a prominent automobile racing man. Practically all the Liberty and other airplane engines and many airplane parts have been produced in automobile factories, which were the only plants in the country possessing sufficient manufacturing equipment to produce such engines and parts in the necessary volume.

During the year there has been an upward trend in passenger-car prices, but early in December, following the signing of the armistice, most of the large manufacturers of passenger cars announced a reduction in price of from $100 to $300 in anticipation of the enormous production programme started upon. Motor-truck prices during the year have increased, due to the higher cost of materials and labor, and inquiry among the motor-truck manufacturers reveals that the present prices will be maintained for a considerable period.

Automobile Design.—As a result of the nation-wide appreciation of our national extravagance, we have learned to realize that quick, certain and, above all, efficient transportation is the greatest demand of the age. Our great national fault of extravagance is shown quite clearly in our automobiles. The American people have been buying cars by size and weight. Two cars, each costing the same, but one larger and more gaudy than the other, if placed side by side and offered for sale, would not compete, as the larger one would command nearly all the attention in spite of the fact that the other might be a better piece of engineering from end to end. But a change has come. A great wave of economy has swept over the country, and car owners are demanding more efficient automobiles and are purchasing them with a greater consideration for the factor of maintenance and low cost of operation, rather than a major consideration for the number of novelties and excellence of exterior finish which formerly largely determined the popularity of a passenger automobile.

Passenger cars are now designed to meet the demands of people who are looking for a car in which the weight per passenger is at the lowest limit—in other words, a car that utilizes every inch of wheelbase to the greatest possible efficiency, that does not have a motor of greater power than is necessary to carry the load, that has material which, because of very light weight and scientific distribution, gives the greatest service. No longer are purchasers looking for the biggest car that they can buy for a certain amount of money. In the new cars brought out during the year greater attention has been paid to the factors that promote efficiency in the motor. For instance, combustion chambers have been more carefully shaped, and this improvement is combined with a tendency toward larger valves, more scientific cam contours, better designed intake passages, and superior carburetion secured by the hot-spot manifold and carburetor mixing chambers. The use of kerosene vaporizing devices has increased, particularly on trucks, to a greater extent during 1918 than during any similar period in the history of the industry.

Comparing specifications of all American passenger cars on the market, we see that the average cylinder size is 3½″ x 5″. The average displacement based on the percentages of numbers of cylinders is 269 cu. in. In regard to engines of different cylinders the following averages obtain:

Number of Cylinders	Bore, inches	Stroke, inches	Piston Displacement (cubic inches)
4	3.6	4.95	221
6	3.46	5.00	282
8	3.13	4.59	282
12	2.87	4.96	386

The use of overhead-valve engines has increased three per cent. during the year, and this increase would have been larger except for the fact that the assembled cars practically all used L-head engines, due to the fact that the largest builders of stock power plants confine their efforts to the L-head type of engine. It is a known fact that the overhead-valve type engine has a greater power output for any given displacement, and where efficiency is the controlling factor, preference has been given to this type. The use of multiple-valve engines, that is, engines having more than two valves per cylinder, has increased because of the greater power and efficiency obtained from engines of this type. All new engines brought out during the year have detachable cylinder heads.

For three years the fuel problem has exerted a highly important influence on engine design. In 1918 there has been a crop of the so-called hot-spot manifolds. There is no doubt that the use of these has resulted in a material reduction in the warming-up period. This is of considerable importance, as with the highly efficient choking devices employed on up-to-date carburetors a stream of raw gasoline is drawn into the cylinder during the cranking period, and naturally some of this leaks past the piston rings, with the result that considerable crankcase dilution occurs, destroying the lubricating qualities of the oil.

Cold-weather starting is engaging the attention of automotive engineers. During the year many suggested means have been offered for solving the difficulty. Probably the most promising of these is the system in which a small electric coil is employed to heat a small quantity of gasoline, which is thus evaporated, throwing into the cylinder a drier product which facilitates combustion and at the same time is more free from the evils of crankcase dilution. In one of these primers the electric coil is located in the float bowl of the carbureter, and in another a cylindrical well is employed of slightly larger diameter than the pencil-shaped coil.

Single ignition has been continued and has been improved in detail. The battery, breaker mechanisms and coil have all been improved. One company has developed a battery in which rubber separators are used with threaded wicks which carry the active material in the desired manner. Breaker boxes and coils operate faster than ever, this being necessary to take care of the increased crankshaft speeds at which engines operate. Manufacturers have difficulty in keeping up the quality of breaker points, owing to the scarcity of platinum and tungsten.

Bodies generally have been altered only in exterior lines. The beveled edge is typical. There has been a slight tendency toward improvement of the front compartment, a thing sought for in some quarters during the past three years. Where there has been a gain of additional space, this has usually gone into the front compartment rather than the rear. The color situation is better now than it was a year ago, although it is not easy to secure the desired pigments even now. A number of brighter colors are now in evidence, showing the tendency toward individuality, particularly among manufacturers who make in the neighborhood of 10 to 15 cars a day.

NAVAL ARCHITECTURE AND MARINE ENGINEERING

Daniel H. Cox

Shipbuilding. — During 1918 the acute shipping crisis which confronted the United States on our entry into the war (see I, *War Organization*) was largely met by the development of the shipbuilding facilities, both public and private, described in the last issue of the Year Book (p. 565). Under the programme adopted by the Emergency Fleet Corporation in 1917, existing yards were worked to full capacity; private capital was encouraged to enter into the shipbuilding industry and as many new shipyards were established as, taking into consideration the labor market and material production of the country, seemed advisable; and three very ambitious and extensive establishments of the fabricating-yard type were created, all of them financed entirely by Government capital, the management acting as the agents of the Corporation, these being the American International Shipbuilding Corporation at Hog Island, Pa., having 50 ways, the Submarine Boat Corporation on Newark Meadows, N. J., with 28 ways and the Merchant Shipbuilding Corporation at Bristol, Pa., with 17 ways. During the entire year, by reason of the fact that so many new shipbuilding facilities were in process of creation, the shipbuilding output continually increased from month to month, and had it not been for the termination of the war in November, this increase would have extended into 1920.

As the various new yards were created, a programme was prepared for the operations in each yard and an estimate formed of the vessels that might be expected to be completed during the season of 1918. On making a survey of the situation at the close of the year, it was found that the shipyards in producing condition at the beginning of the year and certain of those which came into production during the first quarter produced at least as many vessels as had been anticipated, but that the yards that were not finished until after the middle of the year did not really come into production in time to be of service before the termination of the war. The three main fabricating shipyards above mentioned were a great disappointment so far as results during 1918 were concerned. These yards based their promises of great production upon the concentration of work in one spot, expecting that there would be no considerable difficulty in securing the necessary number of trained operators to handle expeditiously the immense amount of material necessary in connection with the many shipways at each plant. Unfortunately the labor supply, due to the demand for war purpose in all trades, was so diminished that it was impracticable to secure the men needed in time to make these yards effective. Good progress, however, has been made by them in ship construction, and undoubtedly had the pressure not been removed by the termination of the war, remarkable results would have been secured from these yards within a few months' time.

Notwithstanding the failure in these specific cases, the output of shipping in the United States during the year has been remarkable. From the records now available it is evident that during the year 1918 there will have been delivered and placed into commission approximately three and a half million deadweight tons of shipping, a remarkable achievement. The growth of the shipbuilding industry in the country is well indicated by the fact that at the present time there are about 200 shipyards in operation instead of about 66 in November, 1916. (See also XVIII, *Manufactures.*)

Standardized Ships.—Not only were new shipbuilding industries created, but in addition various existing shipyards were urged to increase their facilities by the addition of new ways or shops, and a successful effort was made in the line of standardizing ship production in various yards. While it was not found possible or practicable to insist on the building of identical ships in the various yards in the country, a strong effort was made to reduce the number of types as far as possible, and in most instances each shipyard was employed in building but one, or at most, two types of vessels. The various specifications for vessels were standardized so far as possible in order to make the various machinery installations, auxiliaries of various kinds, and equipment interchangeable among the many types of vessels, and further to provide in the structure of the vessels as small a number of different sizes and weights of shapes and plates as could be arranged. This carefully conceived plan was found most effective, and greatly aided the manufactures of material and equipment to supply the pressing needs of the shipyards. (See also *Civil Engineering, supra.*)

After the termination of hostilities immediate steps were taken by those in charge of the programme to analyze the various types of vessels that were under contract at the time and see in what respects it might be possible by modifying these vessels to improve in any way their efficiency or usefulness. At the same time a careful study was made of the requirements of shipping in the future, and building programmes are now being considered including such types of vessels, particularly those of larger size and greater speed, as have been determined to be essential for the carrying trade of the country in the future.

Wooden Ships.—Due to the evident impossibility at the outset of securing in sufficient time the necessary tonnage of steel vessels, a very extensive programme of wooden vessels was commenced, and many of these vessels have been completed and put into service during the year. Their construction was a matter of great difficulty owing to the limited supply of men familiar with this industry and to the very small number of wooden shipbuilding facilities in existence at the outbreak of the war. There has been some criticism of the wooden shipbuilding programme, but a careful survey of the conditions and consideration of the results obtained will show that taking into account the available facilities a very creditable showing was made in the wooden ship programme, and that as an emergency measure this programme was undoubtedly justified.

Concrete Ships.—In addition to the wooden ship construction, after due consideration of the progress made in concrete shipbuilding abroad and the results that might be expected by the use of concrete, the Emergency Fleet Corporation entered upon a limited programme of vessels of this type of construction. None of these vessels was completed and put into service during 1918 but they will be in operation early in the season of 1919. Judging from the results of the concrete steamer *Faith* of approximately 3,000 gross tons, built on the Pacific Coast by private capital, it may be expected that these new vessels will give satisfaction in service. (See also *Civil Engineering, supra,* and *Materials of Construction, infra.*)

Unsinkable Ships.—Due to the danger from submarine attack, many schemes were submitted for consideration that were claimed to make vessels unsinkable or nearly so. One of these ideas, in which a portion of the interior of the vessel not required for cargo when carrying heavy material, was fitted with so-called buoyancy boxes designed to keep the vessel afloat after torpedo attack, was tried on the steamer *Lucia.* This vessel by a peculiar coincidence was torpedoed and although she remained afloat a number of hours after being attacked, she finally sank and the uselessness of this method of ship protection was demonstrated.

Marine Engineering. — The same reasons that have held back any particular development of the types of vessels being built and put into operation have effected the engineering features of these vessels. It was necessary to use as prime movers such machinery, including main engine boilers and auxiliaries, as could be produced with the existing facilities and make it possible to equip promptly the large number of vessels under construction. No time was available for experimentation or development of new ideas or refinement in engineering practice. Inasmuch as the manufacturing facilities of the country made it possible to secure a greater number of geared-turbine units for ship propulsion than of reciprocating engines in the early stages of the programme and on account of the demonstrated efficiency of the geared turbine, the majority of the vessels contracted for were of the geared-turbine type, turbines and gears being merely repetitions of installations already made and found to be satisfactory. Due to the very natural difficulties attendant upon the operation of these geared turbine units by inexperienced men, however, a strong effort has been made to increase the reciprocating engine production in the country and as a result a larger proportion of the later vessels built by the Emergency Fleet Corporation are being equipped with reciprocating engines.

The production of the necessary horse power in boilers for the immense fleet under construction has been a serious problem. As it was obviously easier to secure a large production in water-tube boilers than in Scotch boilers, many of the earlier ships contracted for were equipped with water-tube boilers although it was realized that a larger proportion of Scotch boilers would have been desirable. The manufacturing possibilities of Scotch boilers have been greatly increased, and in the latter part of the programme a greater number of the vessels have been equipped with Scotch boilers.

Electric Welding.—Among other efforts that have been made to speed up the production of shipbuilding has been the careful consideration and development of the process of electric welding as applied to shipbuilding needs in the various branches. An Electric Welding Committee was formed, acting under the control of the Emergency Fleet Corporation, which investigated all the known means and methods of electric welding, secured a vast improvement in the manufacture of the necessary appliances, trained a large number of operators in the art of electric welding, arranged with the classification societies to permit the use of electric welding in many portions of the ship's structure, and interested the shipbuilders in the adoption of these methods. This work has been productive in many ways, not only shortening the time required for certain portions of vessel construction, but also resulting in direct economy in the cost of manufacture.

MATERIALS OF CONSTRUCTION[1]

C. L. Warwick

Cement.—An important development in the cement industry has been the adoption of revised "Standard Specifications and Tests for Portland Cement" (*A. S. T. M. Standards*, 1918) requiring much finer cement than heretofore—not over 22 (instead of 25) per cent. may be retained on a No. 200 sieve—and thereby necessitating a considerable change in manufacturing practice. Other important changes are the omission of the "neat" tension test and the increase of required tensile strength of mortar at 28 days from 275 to 300 lb.

The proportions of the principal components of Portland cement usually lie within certain empirical limits. Cements have been made commercially, however, with a high proportion of silica. Tests indicate that such cement, while somewhat more expensive, is apt to be more reliable than the average cements, and superior for uses which do not demand rapid hardening, although it would frequently be rejected under a literal enforcement of the present specifications (Billings, "High-Silica Portland Cement", *Proc. Am. Soc. Test. Mats.*, xvii, Pt. II).

Tests of high-magnesia Portland cement reported by P. H. Bates (Bureau of Standards Tech. Paper No. 102) indicate that magnesia up to 9.5 per cent. produces no marked change in soundness or time of set, while satisfactory strengths are developed up to 7.5 per cent. Contrary to current opinion, the strength of concrete made with high-magnesia cement is not materially affected by storage in sea water. The standard specifications limit the magnesia content to five per cent.

Properties of Concrete.—Although water is one of the essential ingredients of concrete, a study of its functions has until quite recently been almost wholly neglected, while the functions of cement and aggregate have been carefully studied. The importance of water in determining the properties of concrete is now conclusively demonstrated by tests covering a wide range of mixes, grading of aggregate, and consistency, reported by D. A. Abrams (*Proc. Am. Concrete Inst.*, 1918). The relation between compressive strength and amount of water is expressed by the equation $S = A/B^x$, where S = compressive strength, x = ratio of water to cement by volume, and A and B are constants depending upon quality of cement, time of mixing, age of concrete, etc., provided the concrete is not too dry for maximum strength and the aggregate not too coarse for a given quantity of cement. The author concludes that "the water content expressed as a fraction of the volume of cement in a batch is the only satisfactory criterion for strength of concrete made up of given materials mixed in widely different proportions." Thus a concrete from well graded aggregate gives a higher strength than one from poorly graded aggregate, the materials in each case being the same, only because the former can be produced by the use of less water for a given quantity of cement.

The important function of water in the making of concrete has also been pointed out by N. C. Johnson (*Eng. Rec.*, Dec. 30, 1916). From examination of defective structures Johnson concludes that excess water is largely responsible for the formation of laitance bands, which are points of serious weakness.

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[1] This article covers the two years 1917 and 1918, the customary review having been unavoidably omitted from the Year Book for 1917.

Other important conclusions from the tests reported by Mr. Abrams are:

1. Compressive strength of concrete increases with increase in time of mixing, the relation being expressed by the equation $S = k + n \log t$, in wnich $S =$ compressive strength, $t =$ time of mixing, and k and n are constants. The beneficial effect of increased mixing appears to have been overestimated.
2. Wide variations in the temperature of the mixing water have little effect on the strength of concrete.
3. Regardless of mix, consistency, or character of aggregate, the strength of concrete increases with age so long as the concrete is not allowed to dry out, the relation being expressed by the equation $S = S \log A - D$, in which $S =$ compressive strength, $A =$ age, and C and D are constants. The erroneous opinion that concrete decreases in strength during certain periods appears to be based upon analogy with tension tests of cement briquettes, which are shown to be misleading.

In another series of tests (*Proc. Am. Soc. Test. Mats.*, xvii, Pt. I), Abrams has shown that the compressive strength of concrete is unaffected by speed of testing, provided the last 12 to 15 per cent. of the ultimate load is applied at slow speed, thus enabling the work of testing to be expedited without sacrifice of accuracy.

Colorimetric Tests of Sand.—The examination of defective sands has shown that their low strength as mortar is frequently due to organic impurities of a humus nature, the presence of which may be detected and their relative effect estimated by digesting the sample of sand in a solution of sodium hydroxide and comparing the depth of color of the filtered solution with proper standards (*ibid.*).

Concrete in Sea Water.—After examining nearly every concrete structure in sea water in the United States (*Eng. News-Rec.*, lxxix, 1917), R. J. Wig and L. R. Ferguson have reached the following conclusions:

(1) Irrespective of location, the best concrete will be chemically attacked by sea-water and progressive disintegration will occur once the surface has been appreciably abraded.

(2) Reinforced concrete in sea-water shows unmistakable evidence of deterioration due to corrosion of embedded reinforcement above the water line, which is caused by the accumulation of chlorine salts in the pores of the concrete by capillarity and absorption from the air.

(3) Good materials, conservative design, proper methods of construction, and adequate protection against abrasion are essential if sea-water concrete is to be made safe.

Concrete in Ship Construction.—The problem of producing a commercially successful concrete ship, as stated by R. J. Wig and S. C. Hollister (*Proc. Am. Concrete Inst.*, 1918), is largely dependent upon the use of a dense, impermeable, light-weight concrete of high strength, sufficiently plastic to work readily in around the reinforcing steel. The concrete now being used in the construction of Government vessels under the supervision of the U. S. Shipping Board (see *Naval Architecture, supra*) consists of one part of cement to three parts of a special fused clay crushed to pass an 0.5-in. screen, weighs only 105 lb. per cubic foot, and has a compressive strength at 28 days of over 4,000 lb. per square inch. The use of considerably finer cement than required by the standard specifications, small-size aggregate, and a rich mix is necessary to secure the desired properties.

Other references to important subjects are:

"Final Report of Joint Committee on Concrete and Reinforced Concrete." (*Proc. Am. Soc. Test. Mats.*, xvii, Pt. I.)

EDWARDS, L. N.—"Effect of Grading of Sands and Consistency of Mix upon the Strength of Plain and Reinforced Concrete." (*Ibid.*, xvii, Pt. II.)

——. "Proportioning the Materials of Mortars and Concretes by Surface Areas of Aggregates." (*Ibid.*, xviii, Pt. II.)

HULL, W. A.—"Comparison of Heat-Insulating Properties of Materials Used in Fire-Resistive Construction." (*Ibid.*, xvii, Pt. II.)

Standardization of Non-Ferrous Metals and Alloys.—Probably the most significant single development in the industry of the non-ferrous metals and alloys is the embodiment in standard specifications of the results of the many recent investigations in this field. The American Society for Testing Materials has recently adopted standard specifications for 88-10-2 bronze, copper for locomotive fireboxes and staybolts, copper and brass boiler tubes, and brass forging rod (*A. S. T. M. Standards*, 1918); and tentative specifications for non-ferrous alloys for railway equipment, cartridge brass, naval brass rods, bronze bearing metals, and aluminium ingots, sheets and casting alloys have been published, as well as methods for chemical analysis of various alloys (*Proc. Am. Soc. Test. Mats.*, xviii, Pt. I). Tentative specifications for babbitt metal mark the first step towards standardization in this industry. The large number of babbitts now on the market are reduced to 12 typical compositions, the physical properties of which are given as a guide to the user. The committee which prepared the specifications has recommended the use of lead-base babbitts wherever possible, owing to the present war shortage of tin.

Season Cracking of Brass.—Season cracking is the term applied to cracks that develop in sound metal, of excellent mechanical properties, often before the application of any external load. While it was first described in 1906, it is only within recent years that failures in important hydraulic works have emphasized the necessity of ascertaining the reasons for such failures and developing methods for preventing their occurrence. Much of our present knowledge of the subject is reviewed in a discussion held at the 1918 meeting of the American Society for Testing Materials (*Proceedings*, xviii, Pt. II), from which the following data are abstracted.

Season cracking occurs in both wrought and cast metal, and particularly in brass of relatively high zinc content. It is due principally to the presence of initial internal stresses localized in effect by corrosive action, which results in the formation of minute cracks (the term "corrosion cracking" has accordingly been recommended as more descriptive of the type of failure). Sudden changes in temperature will also cause cracking of stressed material, resulting in so-called "fire-cracking".

The initial stresses are caused by various operations of manufacture, such as non-uniform or sudden cooling, cold working, and welding, or by non-uniformity of the material. Their presence in any harmful degree may be detected by immersing a specimen in a mercury-salt solution, which accelerates failure by the formation, probably, of a brittle alloy of mercury and copper. Such a qualitative test appears to be a reliable index of the ability of the material to resist season cracking. However, when material is to be subjected to stress in service, quantitative measurement of initial stress should be made wherever possible—for example, by removing successive layers of a specimen and observing the resulting changes in length, or in the case of thin sheets, by observing their curvature after removing a known thickness. By means of such measurements it has been shown that cracking occurs only when the surface layers are under initial *tension* which, for 60-40 brass, is about 25,000 lb. per square inch or over.

Initial stresses may be reduced or eliminated by proper annealing or by mechanical distortion, such as "springing", cold drawing or cold rolling. The former is adapted to such articles as cartridge cases, the latter to rods and tubes. Season cracking may also be prevented by adequate protection against corrosion where possible.

Important references to this subject are:

FLINN, A. D., and JONSON, Ernst.—"Inspection of Brass and Bronze." (*Proc. Am. Soc. Test. Mats.*, xvii, Pt. II.)
HEYN, E.—"Internal Strains in Cold-Wrought Metals." (*Jour. Inst. of Metals*, xii, No. 2.)
MERCIA, P. D., and WOODWARD, R. W.—Bureau of Standards Technical Paper No. 82.

Selective Corrosion of Brass.—As described by H. S. Rawdon (Bureau of Standards Tech. Paper No. 103), selective corrosion of brass, known as "dezincification", converts the clear yellow metal into a weak, brittle reddish mass. It occurs commonly when the metal is immersed in sea water, is accelerated when in contact with electronegative substances or when the metal is under stress, and is not entirely prevented even by thorough annealing. This trouble is particularly prevalent in 60-40 brass condenser tubes, while tubes of Admiralty metal (Cu 70, Zn 29, Sn 1) are more resistant to such corrosion.

Cast and Wrought Iron.—There have been few notable developments in this field. Progress is marked by the adoption of "Standard Specifications for Cast-Iron Soil Pipe and Fittings", which meet a large need in the field of sanitary engineering, and of "Standard Specifications for Wrought-Iron Forgings" (*A. S. T. M. Standards,* 1918). Improvements in the heat treatment of malleable castings have resulted in the production of superior castings, for which proposed standard specifications now require improved physical properties—a tensile strength of 45,000 compared with 38,000 lb. per square inch, and an elongation in two inches of 7½ compared with five per cent. (*Proc., Am. Soc. Test. Mats.,* xviii, Pt. I).

Alloy Steels.—The uses of alloy steels have grown steadily as their adaptability to automobile and airplane construction becomes more evident. This has been especially true of chrome and chrome-nickel steels, which are finding a wide range of application. Special alloy steels have been developed for use in body armor, helmets, etc.

The effect of copper in medium-carbon steel has recently been studied by C. R. Haywood and A. D. Johnston (*Bull. Am. Inst. Min. Engrs.,* January, 1918). Two steels in the form of forged bars one inch square, containing respectively 0.03 and 0.86 per cent. of copper and otherwise of approximately the same composition, were subjected to various heat treatments and tested for physical properties. Irrespective of treatment, the higher copper steel invariably showed higher tensile strength and yield point, and in general higher values of reduction of area; while its percentage of elongation was somewhat lower than that of the low-copper steel. These results confirm in general the work of earlier investigators.

While experimental steels have been made in which copper has been successfully substituted for nickel, and a limited amount of nickel-copper steel has been made by adding Monel metal (an alloy of copper, nickel and iron) to steel, it is only within recent months that a process has been developed for direct smelting of the nickel-copper Sudbury ores found in Canada. By roasting the ore in a basic electric furnace and then suitably refining, nickel-copper steel of high quality is produced which satisfactorily meets all the requirements of nickel steel, as may be seen from the following typical tests:

	Nickel Steel	Nickel-Copper Steel
Nickel, per cent	3.36	3.62
Copper, per cent	....	0.48
Carbon, per cent	0.46	0.44
Manganese, per cent	0.70	0.50
Tensile strength, lb. per sq. in.	122,000	115,000
Elastic limit, lb. per sq. in.	74,600	72,400
Elongation in 2 ins. per cent	16	22
Reduction of area, per cent	34	51

The ductility of the nickel-copper steel is significant.

"Cobaltcrom", a cobalt-chrome tool steel, is described in *Engineering* (July 6, 1917). While tungsten is still the "key alloy" for tool steels, cobalt has been found to impart to steel the important property of red-cutting hardness possessed by tungsten steels. Cobaltcrom appears to have the further advantage of hardening at lower temperatures.

A valuable contribution to our knowledge of alloy steels is contained in a discussion on the "Rôle of the Several Alloying Elements in the Alloy Steels" (*Proc. Am. Soc. Test. Mats.,* xvii, Pt. II), in which the properties imparted to steel by the alloying elements manganese, nickel, silicon, vanadium and chrome-vanadium are discussed.

Effect of Phosphorus and Sulphur in Soft Open-hearth Steels.—In a paper on the effect of phosphorus in open-hearth steels (*Year Book Am. Iron and Steel Inst.,* 1918) J. S. Unger describes a series of experiments with nine acid and basic open-hearth steels as near alike in composition as possible except in phosphorus, which ranged from 0.008 per cent. in the basic to 0.115 per cent. in the acid steel. A careful study of these tests indicates that although the steels increase in hardness with the increase in phosphorus, they do not become brittle or cold-short within the limits of phosphorus used. Such investigations as this and one by the same author on the effect of sulphur reported in this review two years ago (*A. Y. B.*, 1916, p. 585) lead one to inquire whether the influence of phosphorus and sulphur is as bad as commonly supposed. Certain it is that much difficulty has been experienced in the past year or more in meeting the requirements of specifications for low sulphur and phosphorus, owing largely to the difficulty of obtaining low-sulphur coke and low-phosphorus pig iron. The situation became so acute in the summer of 1918 that, purely as a war emergency measure, the American Society for Testing Materials raised the sulphur limits for all steels and the phosphorus limits for acid steels 0.01 per cent. in many of its steel specifications.

Cast Steel Anchor Chain.—An interesting development of 1918 has been the application of cast steel to the manufacture of anchor chain. Until quite recently, wrought-iron chain has been used almost exclusively in ships, wrought mild-steel chain having proved either too ductile to retain its shape or too hard to weld properly. Under the necessity created in 1917 by the demand of the Emergency Fleet Corporation for anchor chain, however, successful experiments were conducted along the entirely new line of casting chain from electric steel. As described in a paper by H. J. Cox and in the discussion thereon (*Proc. Am. Soc. Test. Mats.*, xviii, Pt. II), two distinctly different steels were developed, one a relatively soft ductile steel, considerably stronger than wrought iron but equally as tough; the other a special heat-treated alloy steel (known commercially as "Naco" steel) combining with high tensile strength a remarkable ability to withstand shock. Specifications for electric cast-steel anchor chain have been published tentatively by the American Society for Testing Materials (*Proceedings*, xviii, Pt. I).

Tests of Steel Columns.—Tests of 18 half-size models of heavy compression members designed for three long-span bridges, the Municipal Bridge at St. Louis, the C. B. & Q. bridge at Metropolis, Ill., and the bridge at Memphis, Tenn., have been conducted by the U. S. Bureau of Standards (Tech. Paper No. 101) to determine the strength of the columns under intended axial loads and to study the laws of distribution of the stresses. The columns were constructed of various alloy and high-carbon steels, and were representative of the most recent bridge practice. Two of the most important conclusions drawn may be mentioned: (1) in the case of the 12 columns which failed as units, the maximum loads agree closely with the yield point in tension of the steel used in their fabrication, the average deviation of the maximum loads from the mean yield point of all tests being only 0.5 per cent.; (2) column loads in practice should not exceed the proportional limit of the fabricated column, whose mean value was slightly less than half the maximum stress.

Mention should also be made of the "Report of the Special Committee on Steel Columns and Struts" (*Proc. Am. Soc. Civil Engrs.*, December, 1917), containing results of another important series of column tests. These two investigations merit the careful study of structural engineers.

Magnetic Analysis of Steel Products.—In a paper entitled "Some Applications of Magnetic Analysis to the Study of Steel Products" (*Proc. Am. Soc. Test. Mats.*, xvii, Pt. II), C. W. Burrows defines magnetic analysis as the correlation of the magnetic and other properties of materials, particularly the mechanical properties of steel, which are known to bear definite relations to such magnetic properties as coercive force, hysteresis and permeability. Practical applications of magnetic analysis to raw material and finished products are discussed, with particular reference to the testing of steel rails and tools.

Tension Tests of Steel.—A study of the effect of size and form of specimen on tension tests of steel has been conducted by a committee of the American Society for Testing Materials (*Proceedings*, xviii, Pt. I). The form of specimen is expressed by the function $l/\sqrt{a}$ where l = gauge length and a = cross-section area.

Elastic limit, tensile strength and reduction of area vary only slightly for wide variations in $l/\sqrt{a}$. Percentage of elongation after fracture is, however, profoundly affected, increasing by a straight-line variation for decreasing values of $l/\sqrt{a}$ within the ranges of this function (about four to 13) for ordinary test specimens. This has led to the recommendation of the committee that the value of $l/\sqrt{a}$ of the present A. S. T. M. standard two-inch test specimen ($=4.5$) be used to govern the dimensions of other test specimens.

Textile Materials.—The growing importance of aircraft has emphasized the need for carefully drawn specifications and tests for the various forms of textile fabrics used in the construction of airplanes, balloons and dirigibles. One of the chief difficulties experienced in the testing of such fabrics is their marked hygroscopic action, both linen and cotton absorbing a considerable percentage of moisture. In a paper on the "Effect of Moisture on the Tensile Strength of Aircraft Fabrics" (*Proc. Am. Soc. Test. Mats.*, xviii, P. I), G. B. Haven points out the difficulties of testing textile fabrics in their "bone-dry" condition, or under standard atmospheric conditions (70° F. and 65 per cent. humidity), and recommends that tensile strength be determined under normal atmospheric conditions and corrected to a "standard moisture regain," which for manufactured cotton fabric is taken as 6.5 per cent. The reliability of this method depends upon an exact knowledge of the effect of moisture on the tensile strength of fabric, which can only be obtained by careful, precise tests. The paper contains a description of such tests and presents typical strength-regain curves. Heavy cotton fabrics, such as tire duck, and wing linen gain about seven per cent. of their dry strength for each added per cent. of moisture, while light cotton fabrics gain about three per cent. Since manufactured cotton rarely shows less than three or more than 6.5 per cent. moisture regain, a correction equation has been developed based upon the portion of the curve lying between those values.

Methods of making tension and other tests of fabrics are described in reports of the Committee on Textile Materials (*ibid.*, xvii, xviii, Pt. 1).

Timber.—Tests reported by I. H. Cowdrey (*Jour. Am. Soc. Mech. Engrs.*, May, 1918) indicate that air-dried Douglas fir reabsorbs moisture more rapidly than southern yellow pine, but that its compressive strength, which in the air-dried condition is about 20 per cent. less than that of yellow pine, does not decrease so rapidly as the moisture content increases. From observation of specimens immersed for varying periods in moist air at 120° F. and in water at 70° F., the author concludes that while the former is more severe, either is capable in time of producing fibre saturation, so that timber subjected to such conditions in practice should be designed on the basis of constants determined from tests of green timber.

Testing Apparatus.—A semi-autographic apparatus for determining the proportional limit of materials is described by H. F. Moore (*Proc. Am. Soc. Test. Mats.*, xvii, Pt. II). A pencil so arranged as to move vertically a distance proportional to the travel of the poise of the testing machine, draws a record on a paper attached to a drum which an operator rotates a distance proportional to the deformation of the test specimen, as observed by a self-indicating extensometer. The resulting diagram consists of a number of "steps" decreasing in height as the proportional limit is passed. The curve connecting the corners of the steps is the stress-strain diagram.

XXI. MATHEMATICS AND ASTRONOMY

MATHEMATICS

G. A. Miller

History of Mathematics.—The outstanding fact relating to the history of mathematics during 1918 is the establishment of a regular university chair devoted to this subject at the University of California. Prof. Florian Cajori, who was connected with Colorado College since 1898 and is the author of several works on the history of mathematics and physics, was elected as the first incumbent of this chair, and hence he enjoys the unique distinction of being the first regular university professor of this history in the world. According to *Minerva*, Max Simon was elected honorary professor of the history of mathematics in the University of Strassburg in 1904, and A. E. Haas was elected in 1916 to a professorship of the history of physics in the University of Leipzig. Various university chairs devoted to the history of general science were established during the last two or three decades, and in 1891 the Belgian Government made a course in the history of physical and mathematical sciences obligatory for all candidates for the doctor's degree in these fields.

The founding of a chair devoted to the history of mathematics in an American university is especially significant in view of the fact that greater emphasis on historical items has been one of the outcomes of the modern reform movement relating to the teaching of mathematics. Our mathematical textbooks contain an increasingly large number of historical notes, and some of them include even pictures labelled Euclid, Archimedes, or with the name of some other ancient mathematician about whose personal appearance we know absolutely nothing. An interesting fact in the history of modern mathematics was pointed out by a noted French mathematician, H. Lebesgue, in the April, 1918, number of the *Bulletin des Sciences Mathématiques*, where it is noted (p. 94) that the hope relating to the *practical* usefulness of elliptic functions, expressed by mathematicians for more than a century, has not yet been realized in a single instance. In the domain of pure mathematics these functions are very useful, and mathematicians still hope that they may become practically useful.

Effects of the War on Mathematical Advances.—In the review of current advances in mathematics published by P. E. B. Jourdain in *Science Progress* for July, 1918, attention is called (p. 1) to the remarkable recent decrease in publication of mathematical work in the Central European Empires, especially in Germany. It should not be assumed that their production of mathematical work has decreased in the same ratio, but this great decrease in publication is nevertheless a significant fact. At the opening of the war mathematical publication in Germany had reached high-water mark. In addition to the numerous regular periodicals devoted mainly to new results, there were being published various extensive works of wide international circulation. Among the latter are the large mathematical encyclopedias in French and in German: Pascal's *Repertorium der höheren Mathematik;* the works of Euler, whose publication was being fostered by international subscription and by an international society; the elaborate German reports issued under the auspices of the International Commission on the Teaching of Mathematics; and the mathematical volumes of the series bearing the title, *Die Kultur der Gegenwart.*

No other country produced mathematical literature on such an extensive scale, and our larger mathematical libraries tended more and more towards exhibiting a German preponderance. Since the beginning of the war there has been a considerable diminution in the total mathematical publication, but the relative decrease outside of the Central European Empires has been much less than that within these countries. In South America, in particular, a new mathematical periodical was started during this period, namely, *Revista de Matematicas*, the second volume of which was completed during the early months of 1918. Africa and Australia are now the only continents which do not possess a regular mathematical periodical of an advanced grade.

Advances in Pure Mathematics.—Some of the important current mathematical advances are briefly described in the *Proceedings of the National Academy of Sciences.* Among those so described during 1918, we may mention the following. O. E. Glenn (Pennsylvania) gives a summary of results relating to invariants which are functions of parameters of the transformation, and presents a general doctrine of orthogonal concomitants for transformations with four parameters. G. H. Hardy (Cambridge) considers the representation of a number as the sum of any number of squares and deduces formulae from the theory of elliptic functions for the cases when the number of these squares is five or seven. D. N. Lehmer (California) studies a general type of continued fraction for the purpose of accounting for curious theorems relating to the regular continued fraction which represents the base of the Naperian logarithms. A. Emch (Illinois) gives results of an investigation relating to the geometric properties of closed curves described by a spherical pendulum. E. J. Wilczynski (Chicago) gives a brief outline of invariant theories, and proves a general theorem relating to the invariance of the coefficients of a unique canonical form.

Teaching of Mathematics.—The war has affected the teaching of mathematics in many ways. It seems natural to assume that the quickening of our sense of justice towards the smaller nations should affect our views regarding the smaller people in our own midst. Among the longer investigations published in 1918 and aiming to test more accurately the mathematical abilities of students are "An Investigation of Certain Abilities Fundamental to the Study of Geometry," by J. H. Minnick (Pennsylvania), and "Experimental Tests of Mathematical Ability and their Prognostic Value," by Agnes L. Rogers (Columbia). One of the interesting results of the latter investigation is the close connection which it establishes between the ability to understand language accurately and the ability to grasp mathematical concepts. In fact, it would appear that verbal ability tests enable us to predict ability in algebra with as great a chance of success as geometry tests would, and that verbal tests are also as reliable bases to predict success in geometry as algebra tests are. The report of Professor Mann on engineering education, published as Bulletin No. 11 of the Carnegie Foundation for the Advancement of Teaching, has vital contact with the reform movement in the teaching of mathematics.

The teaching of mathematics in the colleges was greatly affected by the heavy demands made on the mathematical departments by students preparing for military service. In many cases these departments had to handle more than twice their usual number of students, and had to modify their former courses very materially to provide the required training in the briefest possible time. There was naturally a considerable shifting of emphasis. In particular, the subject of mathematical probability, with the closely related subjects of permutations and combinations, had to be given much more attention in view of its direct usefulness. In our American mathematical courses the subject of probability based in the final analysis on the notion of a group of transformations (*Encyclopédie des Sciences Mathématiques,* Tome I, Vol. 4, p. 4) has seldom received sufficient attention, and it remains to be seen to what extent the recent readjustment will tend to give to this subject its proper emphasis.

Personal Notes.—G. D. Birkhoff (Harvard) was elected member of the National Academy of Sciences. E. V. Huntington (Harvard) was elected president of the Mathematical Association of America. G. Cantor (Halle), founder of the theory of aggregates, died on Jan. 6. E. W. Davis (Nebraska) died on Feb. 3; M. Bôcher (Harvard) died on Sept. 12. H. G. Keppel (Florida) died on Oct. 5. A. B. Coble (Johns Hopkins) was elected professor of mathematics in the University of Illinois. H. L. Rietz (Illinois) was elected administrative head of the department of mathematics in the University of Iowa. C. H. Sisam (Illinois) was elected professor of mathematics in Colorado College.

ASTRONOMY

R. S. Dugan

Eclipses.—There were three eclipses in 1918. A solar eclipse of June 8 was visible as a total eclipse within a belt crossing North America from the State of Washington southeastward to Florida. As a partial eclipse it was visible all over the rest of North America. A partial eclipse of the moon on June 23-24 was partly visible in North America. A solar eclipse of Dec. 3 was visible as an annular eclipse in a path beginning in the Pacific, 10.5° south of the Equator in long. 119° W., crossing lat. 35° S. in South America, and ending on the west coast of Africa.

The path of the total solar eclipse of June 8 was more favorably located for American observers than that of any other such eclipse since 1900 (*A. Y. B.*, 1917, p. 571). Meteorological data were procured by the astronomical journals, and the desirability of various sites along the track of the shadow was estimated with reference to relative probability of freedom from interfering clouds at the critical time. The diameter of the moon's shadow where it intersected the surface of the earth at South Bend, Wash., was about 66 miles; the duration of totality was 2 min. 1 sec., with the sun still high in the sky. As the shadow swept southeastward across the country, its diameter at the surface of the earth grew steadily smaller and its velocity along the surface rapidly increased. The total time of passage across the continent was but 47 minutes. On the east coast of Florida there was but 50 sec. of totality, with the sun just above the western horizon.

Eclipse parties spend much time and effort in preparing for the astronomical observations which can be secured only during the few seconds of totality, and their disappointment when balked by clouds is peculiarly pathetic. Especially elaborate preparations to make use of the 20-in. telescope of the Chamberlin Observatory at Denver, the only permanent observatory in the path of the shadow, were frustrated by a completely overcast sky. To the 20-in. telescope were attached a spectrograph, from the Yerkes Observatory, to determine the rotation of the corona, and also the Allegheny Observatory star camera, with which it was hoped to secure photographs of the stars surrounding the sun, before and after, as well as during, eclipse. The careful measurement of the star positions on such plates should have furnished a test of the theory of relativity. At some stations a clear afternoon sky made success certain; at others, a sudden break in the clouds at the critical time appeared well nigh miraculous to the anxious observers. Other less favored observers photographed what they could of the brighter parts of the corona through thin clouds.

At Baker City, Ore., a thin haze interfered with the work of the party from the Naval Observatory; nevertheless, many photographs were taken, among them being four exposures by Merrill, of the Bureau of Standards, with films stained with dicyanin (see *infra*), in an attempt to photograph the spectrum to greater wave lengths. Stebbins, at Rock Springs, Wyo., who was "among the lucky ones," secured, according to his programme, photo-electric measures of the brightness of the corona. The party from the Smithsonian Astrophysical Observatory, stationed near

Hartland, Kans., in addition to securing the usual photographs, observed with the pyranometer and wet and dry thermometers from 1 p.m. to 10 p.m. local time on June 8 and again on June 9, to determine the degree of brightness of the sun and sky during the partial phases and the degree of nocturnal radiation during totality. The light of the whole sky, excluding the sun, within one minute of totality was found to equal that of twilight 3¼ hours later. An attempt was made by the Yerkes party, at Green River, Wyo., to record the successive changes of the chromospheric spectra through the second and third contacts by means of a motion-picture camera. In spite of the necessity of photographing through thin cloud, several hundred interesting spectra were secured. Direct photographs of corona and prominences, polariscope observations of the corona, spectrograms of the corona and chromosphere, and observations of shadow bands were secured by various parties.

Novae.—It was also on June 8 that Nova Aquilae III rose to the greatest brilliance of any nova since the one discovered by Kepler in 1604. It was independently discovered by scores of professional and amateur observers. On photographs taken at Harvard and Heidelberg on June 3 and 5, respectively, it appears as a star of about the 11th magnitude. On three Harvard plates taken after midnight on June 7 the nova was of the 6th magnitude. At its brightest, on June 9, it was the most brilliant star above the horizon, its magnitude being about —1, or over 50,000 times as bright as on June 5. It began to fade at once, reaching magnitude 3.8 on June 29. While continuing in general to fade, the light of the nova has fluctuated through as much as half a magnitude, these fluctuations in brightness being attended by changes in the spectrum to be described later. The earliest Harvard photograph of the region, taken on May 22, 1888, shows the nova as a star of magnitude 10.5. It appears on 405 other Harvard plates taken between 1888 and June 3, 1918, as well as on many plates taken at other observatories. A study of these plates shows that the star underwent many small fluctuations in brightness during this interval. The many photometric observations of the star since it developed into a nova will give a very accurate curve of its light variation. The rapid changes in the very complex spectrum of the nova likewise have been carefully watched and recorded. The variation of the absorption bands and lines has been unusually complex, and their gradual shifting from night to night toward the violet, averaging at times as much as 0.75 angstrom per day, has been exceedingly remarkable. Paddock explains the increasing shifts as due to an extraordinary increase in the refractive index of the absorbing masses.

Nova Monocerotis was discovered photographically by Wolf on Feb. 4. The star was then at about magnitude 8.5. The spectrum was already nebular in character, indicating that several weeks had elapsed since its outbreak. The Harvard plates show that on Dec. 22, 1917, the star was fainter than magnitude 9.8; that on Jan. 1, 1918, it had risen to magnitude 5.4; and that it had since continually diminished in brightness.

The highly significant discoveries of four novae in the Andromeda Nebula were announced in the last issue of the YEAR BOOK (p. 573). Four additional ones have been reported in 1918. They are all very faint, of the 17th and 18th magnitudes.

The Sun.—Announcement was made from Mt. Wilson in 1912 and 1913 that measurements had been made of minute displacements of four lines of the solar spectrum which corresponded with displacements theoretically to be expected if the sun behaves as a uniformly magnetized sphere. Measurements of 26 additional lines confirm the preliminary results. The displacements are so small (only a few thousandths of a millimetre) in comparison with the widths of the lines that it was difficult to make sure of their reality. Five members of the Mt. Wilson staff made series of measurements without obtaining positive evidence, while an equal number obtained corroborative evidence. The magnetic axis makes, at most, an angle of a very few degrees with the axis of rotation. The strength of the field found decreases with increasing intensity of the respective lines. Since the line intensity increases with the level at which the lines originate, it seems that the strength of the sun's field falls off rapidly with increasing elevation in the sun's atmosphere. The causes of the sun's general magnetic field remain obscure. The suggestion made in previous papers that it results from a great number of local whirls does not now seem to be an adequate explanation (*Astrophys. Jour.*, May, 1918).

Comets.—Very few comets have been discovered during the year, probably largely because the number of individuals engaged in sweeping the sky for comets has been small. The first new or unexpected comet of the year was discovered by Reid at Capetown on June 12 as a faint, round nebulosity in the southern sky moving due south. It was not visible in northern latitudes, and no further observations have been received. The comet is designated 1918a. A second unexpected comet was discovered by Schorr on Nov. 23 and has been observed at Washington and Williams Bay. This comet is also very faint.

Several periodic comets were due to return to perihelion in 1918. Encke's comet was rediscovered independently by Barnard and Schorr on Dec. 30, 1917, and by Reid on Dec. 31. It became quite conspicuous in the telescope in March, its total light on March 12 being estimated by Jonckheere as equivalent to a star of magnitude 7.7. The early observations indicated that Viljev's predicted time of perihelion passage on March 24 was correct within a quarter of an hour. Wolf's periodic comet, 1884 III, was rediscovered by Jonckheere on July 9 and by Barnard on July 11. At this time its magnitude was 14.5, but by October the brightness had increased about a magnitude. This is the fifth observed return of this comet. Borelly's comet, 1905 II, due to reach perihelion on its second return on Nov. 18, was rediscovered by Fayet at Nice on Aug. 7. It was very faint (magnitude 13) and showed an elongated, diffuse nucleus and a short tail. 1917c, reported in the YEAR BOOK for 1917, proved to be an asteroid.

Asteroids.—Wolf announced the discovery on Jan. 3 of a "moving object, without nebulosity," which he at first suspected to be a comet, on account of its eastward motion in the opposition region of asteroids. It proved on further observation to be an asteroid, the exceptional eastward motion observed being due to the fact that it was at the time very near the earth. The early observations indicated two possible orbits, but after three months of observation it was definitely established that the asteroid was moving in a very eccentric orbit, at perihelion coming within the orbit of Mars, at a distance from the sun of but 1.18 astronomical units. The perihelion distance of Eros, which is the only asteroid coming nearer the sun, is 1.14 astronomical units. The new asteroid is intrinsically very faint and cannot be much more than two or three miles in diameter.

Meteorites.—Sir Wm. Crookes, from an examination of the spectra of 30 specimens of stony meteorites, finds that only four metals, iron, chromium, magnesium and nickel, are present in any quantity, and that, with three exceptions, the relative amounts of the metals are nearly constant. The results suggest that these bodies may have had a common origin (*Philos. Trans.*, ccxvii, p. 411).

The Aurora.—Störmer, who was director of the two expeditions to Bossekop in 1910 and 1913 to study photographically the phenomena of the aurora, has published two papers dealing with the problem of computing the trajectories in the magnetic field of the earth of the electric corpuscles, the arrival of which from the sun have been supposed to cause the auroral phenomena. By neglecting the relative motion of the earth and sun, and assuming that the only force on the particles is the earth's magnetic field and that the earth is a uniformly magnetized sphere, he succeeds in explaining in a general way most of the phenomena of aurorae. The highly colored aurora of March 7 was the most beautiful of the unusually brilliant aurorae of 1918. (*Terres. Mag.*, xxii, 1917, pp. 23 and 97.)

Planets.—Guthnick reports that while the region of greatest brightness on Mars presented itself in 1914-16 at the passage of long. 100° through the central meridian, it came in 1918 nearly five hours earlier, and the minimum, previously in long. 0°, is shifted in the same direction by two to three hours.

Guthnick has made also a series of photo-electric measurements of the brightness of Jupiter from October, 1917, to February, 1918, to find the rate at which the brightness varies with the phase angle (the angle at the planet between lines to the sun and to the earth). The phases measured ranged from one degree to nearly 11°. The change in magnitude for each degree change in the phase angle is found to be 0.0148, a value much larger than that hitherto accepted. This is just about the same as the phase coefficient of Mars. That of the planet Mercury is 2½ times as large.

W. H. Pickering in *Popular Astronomy* for January outlines his "Theory of Aerial Deposition" as an explanation of the phenomena observed on Mars:

> The water from the melting polar cap according to this theory is deposited in the three main depressions on its border, and is then evaporated and carried by aerial circulation of the planet along the curved lines, which, in accordance with Ferret's theory of the circulation of the winds, it must follow. The storm clouds, which in that rare atmosphere should condense at night, would in this manner carry the water and deposit it in the elongated marshes which we see, and call canals.

This is offered as an explanation of the broader and more conspicuous canals. The narrower canals of the secondary type, if their existence is admitted, are to be regarded as the paths of local showers. From the shape and curvature of the principal canals the direction and velocity of the wind may be determined. From the maximum velocity of the wind thus indicated Pickering finds that the minimum pressure of the atmosphere cannot be less than 7.5 in. of mercury. The author of the theory invites the criticisms and suggestions of astronomers and meteorologists.

Spectroscopy.—The old Draper *Catalogue of Stellar Spectra* contains 9,110 entries. The new Draper *Catalogue*, which has been in preparation for the past six years, will give the spectral types of about 222,000 stars and will be of inestimable value to astronomers. Volume I, covering right ascension 0^h to 3^h inclusive, has been published as Volume 91 of the *Harvard Annals*. It is hoped that the copy for the other volumes will be completed within the next two years.

Photographs by Adams and Joy of *o* Ceti (Mira) at its minimum in March show some lines not hitherto photographed, the bright lines being such as are strengthened at low temperature. The conclusion that the radiating gases of *o* Ceti are at a lower temperature at minimum than at maximum seems justified. It may be possible to extend this conclusion to embrace the entire class of long-period variables of type Md.

The importance of dicyanin-stained plates in the photography of the red and infra-red regions of the spectrum has been recently demonstrated by results obtained by the Bureau of Standards, both in the photography of laboratory spectra of various elements and in the photography of the solar spectrum. The limiting region of the visible spectrum (7,600 angstrom units) was photographed in less than one minute, while the region 9,600 angstrom units required only 20 minutes' exposure. The publication of the wave lengths from 6,800 angstrom to 9,600 angstrom, determined from the photographs, will be delayed until after the completion of the measurement of this spectral region of the chemical elements. At the Allegheny Observatory an effort is being made to photograph the solar spectrum beyond 10,000 angstrom and to distinguish between the solar and telluric lines (*Astrophys. Jour.*, Jan., 1918).

Adams and Joy have published a first list of the luminosities and parallaxes of 500 stars, containing results obtained by the new method of determining absolute brightness by the relative intensities of certain spectral lines (*A. Y. B.*, 1917, p. 575). The comparison with directly measured parallaxes of 360 of these stars shows the spectroscopic values to be about +0."004 larger in the mean. The authors were able to extend their curves connecting spectral characteristics and absolute magnitude from magnitude 11.0 to magnitude 13.2 by means of the recently measured parallax of Barnard's proper-motion star (*A. Y. B.*, 1916, p. 593). They find the strontium line at λ 4607 more suited to intensity estimates and more sensitive to changes of absolute magnitude in these dwarf M stars than the calcium line at λ 4455 previously employed. "The high-luminosity stars are characterized by spectra in which both the hydrogen lines and the enhanced lines are abnormally strong. In the spectra of the fainter stars all of the low-temperature lines are strong. The lines used in the determination of magnitude form but a part of this more general spectral distinction." (*Astrophys. Jour.*, Dec., 1917.)

Proper-Motion Stars.—The name Proxima Centauri has been suggested by Innes for the faint companion of α Centauri discovered by him in 1917 (*A. Y. B.*, 1917, p. 573). Recent measures make its motion sensibly equal and parallel to that of α Centauri. The observations of parallax are also in good accord with the assumption that the star is really a companion of α Centauri. The absolute visual and photographic magnitudes are 15.4 and 17.9, respectively. It is the faintest star known.

Recent measurements have reduced the value of the parallax of Barnard's proper-motion star to just over half a second (*A. Y. B.*, 1916, p. 593). This corresponds to a distance of 6¼ light years. The absolute visual magnitude is 13.2, so that this star is over seven times as bright as Proxima Centauri.

Wolf has found near 23 Ophiuchi two star-pairs, four degrees apart, that have the same proper motion of 1¼″ in position angle 222°. One star in each pair was previously known to have large, but not well determined, proper motion.

Globular Clusters.—Shapley's recent communications of results obtained from the continued study of globular clusters (*A. Y. B.*, 1917, p. 574) are remarkable both for the character of the conclusions and for the methods by which the conclusions are reached. The usual method of measuring stellar distance by observation of difference in direction from opposite ends of the earth's orbit, using a base-line of nearly 200,000,000 miles, fails at a comparatively short distance from the sun. General methods based on certain common characteristics of classes of the nearer stars have to be resorted to. Many of the globular clusters contain large numbers of Cepheid or cluster-type variable stars, and measurements of the apparent brightness of these variables in the clusters will tell us how far away they are if we know how bright they really are. Shapley has found a very closely followed relation between the real or absolute brightness and the length of period of light variation of more than 200 variables of this type in our own neighborhood. Cepheids having periods of less than one day average about 100 times as bright as the sun, while those having the longest periods are many times as bright. This happy relation between period and brightness can be used, therefore, to estimate the distance of a globular cluster containing variable stars of this type.

This method is useless, of course, as a means of estimating the distance of a cluster in which no Cepheids have been observed. The situation is far from hopeless, however, for Shapley has found a second fairly constant relation existing in ten clusters studied between the average brightness of the 25 brightest stars and the "median" brightness of the Cepheids present. The "median" brightness of a Cepheid is defined as the mean of its maximum and minimum brightness, and is found to be essentially the same for all Cepheids whatever their maximum brightness, range of variation and period. The real or absolute photographic median magnitude of 183 variables is found to be —0.23. The observed difference between the apparent average brightness of the 25 brightest stars and the apparent median brightness of the variables leads, through the already acquired knowledge of the absolute value of the latter, to the average absolute value of the former in all clusters. A comparison of the real and apparent brightness of the bright stars now gives the distance of a cluster.

The distance of nearly 30 globular clusters are found by the methods just outlined. In the hope of making the estimation of distance altogether independent of the variable stars, the reasonable assumption is next made that globular clusters are closely comparable in actual size. The distances found by the methods described above are plotted against the apparent diameters of the clusters. A curve results which is sufficiently smooth to justify the conclusion that the distances of all clusters may by its use be closely determined from their apparent diameters.

The nearest clusters, ω Centauri and 47 Tucanae, are at a distance of just less than 7,000 parsecs, or about 22,000 light years. The most distant one is N. G. C. 7006, at 67,000 parsecs. One quarter of all the clusters studied are more than 100,000 light years distant. The total mass of a typical globular cluster is estimated at from a quarter to a half million times the solar mass. The diameter of the cluster Messier 3 is about 30 million astronomical units. Light would cross the cluster in 470 years.

By combining directions with distances the distribution of the globular clusters in space can be discussed. Of the 69 clusters studied, 32 are north, and 37 south, of the Milky Way. The Milky Way is seen to be the plane of symmetry of the great system of globular clusters. The system is flattened, with a greatest diameter of at least 300,000 light years. The center of the system is about 20,000 parsecs from the sun. Within a region of about 1,300 parsecs on either side of the galactic plane there are no clusters at all. In this region are nearly all the brighter, scattered stars of what we may call our own cluster. The reason why the globular clusters avoid or cannot exist in this region can be added to the long list of similar problems awaiting solution. The evidence is at least rather striking that our own system and the globular-cluster systems compose one huge system of vast extent. (*Contrib., Mt. Wilson Ob.,* Nos. 151-157.)

XXII. GEOLOGY, METEOROLOGY, AND GEOGRAPHY

GEOLOGY

DYNAMICAL AND STRUCTURAL GEOLOGY

J. B. Woodworth

The "Lost Atlantis" Problem.—What and where was Atlantis, was an old question in the days of Plato. The discovery of the American continent and the exploration of the floor of the Atlantic Ocean have not definitely settled the problem. The chief advance in the course of centuries has been to remove its determination from the hands of general writers on geographic subjects to those of experts in petrography and geological structure. The most recent contribution bearing on the question is the statement by Termier of the French geological service in 1913 that a cable ship in 1898 brought up from depths around 3,000 fathoms between Brest and Cape Cod fragments of a glassy lava such as is known to form only under atmospheric conditions. Termier argued that the occurrence of this rock at the bottom of the Atlantic could be accounted for only by the foundering of a land on which the lava had poured out. Under 3,000 fathoms of water, it was held by Termier, the pressure would have favored crystallization of the magma. Schuchert, in a brief review of Termier's evidence (*Geogr. Rev.* iii, 1917, 64), replies that some petrographers believe that vitrification of lava might occur under the conditions of low temperature prevailing now at the depth cited, owing to the rapid loss of heat which lava would undergo if poured out on the sea floor under water near the freezing point. Schuchert on this account is inclined to regard the specimen as probably detached from the glassy surface of a submarine lava flow.

The Flow of Rocks.—Frank D. Adams and J. Austen Bancroft (*Jour. Geol.*, xxv, 1917, 597), in an article on the amount of internal friction developed in rocks during deformation and on the relative plasticity of different types of rocks, conclude from physical experiments that rocks such as granite and marble can be deformed under differential pressure at ordinary temperatures. For each rock there is a different coefficient of pressure required to produce equal deformation. Hardness of the rock is one of the functions of deformation. In the case of soft rocks, such as alabaster and marble, deformation arises through slipping movements within the constituent crystals on gliding planes, but in hard rocks of the granite type deformation takes place through granulation. In order to develop flow in any rock within the earth's crust, the rock must be submitted to a differential stress greater than that required merely to break down its texture, and very much greater than that which is sufficient to crush it to pieces under the ordinary conditions which obtain at the surface of the earth.

In a following article, discussing the mathematical theory of limiting strength of rocks under stress, L. V. King points out that existing theories of isostacy, in considering the equilibrium of stresses called into action by continental elevations and mountain ranges, should take into account a "compensation of plasticity" on the part of the underlying rock when submitted to greater hydrostatic pressure. The same author concludes that in the event of flow taking place, the region of such flowage would be comparatively near the surface of the earth's crust.

Geological Time.—The opinion of physicists familiar with the behavior of radioactive minerals is that geological time far exceeds that postulated by the geologist untrammelled by physical speculations. Barrell (*Bull. Geol. Soc. Am.*, xxviii, 1917, 745) discusses the measurement of geologic time from the point of view of radioactive minerals in their geological occurrence. As an indication of the trend of opinion as modified by the new light upon the subject of the earth's age, the following table of years abstracted from Barrell's paper is instructive:

PERIOD	Average Age from Lead Ratio	Barrell's Estimate
Carboniferous (Connecticut)...	320,000,000	300,000,000
Devonian, lower or middle (Norway)	380,000,000	355.000,000
Pre-Cambrian, middle (Norway)	1,000,000,000	940,000,000
Pre-Cambrian (Arendal, Norway)	1,200,000,000	1,120,000,000
Oldest granite-gneiss of Mozambique......	1,500,000,000	1,400,000,000

Needless to say, the subject of radioactivity in its geological bearing is in the early stages of investigation.

Geology of the United States.—E. B. Branson has published a handbook of the "Geology of Missouri" (*University of Missouri* Bull., May, 1918), presenting a convenient summary of the stratigraphy of the state in a form for popular comprehension, and giving references to detailed reports for advanced uses. Such a handbook is a desideratum for many states whose geological literature is now overwhelming profuse and inconveniently scattered for the searcher after the broad features of the geology as a foundation for special inquiries.

A readable account of the geology about Camp Lewis near Tacoma, Wash., is supplied in Bulletin No. 18 of the *Washington Geological Survey*, by Morris M. Leighton. A. G. Leonard in a note on "The Geological History" of North Dakota (*Quart. Jour. Univ. of N. D.*, vii, April, 1917) has published a black-line geological map of the state.

John L. Rich (*Econ. Geol.*, xiii, 1918, 120) discusses the age of the unconformity at the base of the Miocene so-called "lake beds" in Idaho, a question which arises also in connection with the geological structure of Montana. Several writers have referred the eroded surface of the rocks folded over this part of the Rocky Mountains at the close of the Cretaceous or in the early Eocene to an Eocene date, and have assumed that the valleys or depressions occupied by the "lake beds" were troughs of erosion below the supposed Eocene surface. Rich points out serious objections to these views.

Lee and Knowlton (U. S. Geol. Surv. Prof. Paper 101, 1917) report, respectively, on the geology and palæobotany of the Raton Mesa and other regions in Colorado and New Mexico. The Trinidad sandstone, in certain sections developed above the Pierre shale, in other sections passes laterally into Pierre shale in one direction and into the usually overlying Vermejo formation in the opposite direction. Lee is showing in the western Cretaceous sections what Huxley recognized and what Newbery later developed in his epoch-making doctrine of "circles of deposition," namely, that sandstones develop at or near shore, clays farther out, and calcareous sediments still farther out; and that with a transgressing sea or aggrading river valley with shifting zones of sedimentation, the several types of sediments become developed one over the other with horizontal passages of one into the other in the same episode of deposition as a necessary consequence of the assorting and distribution of material.

George R. Mansfield (*Am. Jour. Sci.*, xlvi, 1918, 591) puts forth the hypothesis that the bedded phosphates of the Permian in the Cordillera region of the western United States were deposited as beds of carbonate of lime; decaying organic matter in the seawater furnished the matter for the phosphatization of the limestone. D. F. Hewett and C. T. Lupton (U. S. Geol. Surv. Bull. 656) give an extended account, with sections and a map, of anticlines in the southern part of the Big Horn Basin in Wyoming. J. A. Bownocker (U. S. Geol. Surv. Prof. Paper 100-B) has furnished a resurvey of the coal fields of Ohio. In the same document F. R.

Clark has published a computation of the original coal content of the fields as 87,638,000,000 short tons, of which there remains 86,552,000,000 short tons. The paper discusses several factors which enter into the validity of these estimates.

The geology of Alaska receives further contributions from recent work of the U. S. Geological Survey in papers by Philip S. Smith on the Lake Clark-Central Kuskokwin region (Bull. 655, 1917), by Fred H. Moffit on the Upper Chitina Valley (Bull. 675, 1918), and by Henry M. Eakin on the Cosna Nowitna region (Bull. 667, 1918).

Sidney Powers (*Bull. Geol. Soc. Am.*, xxviii, 1917, 501) describes the faults which break the surface of the Island of Hawaii or find expression on other islands in the group. He concludes that the faults are part of a major fracture system, characterized by regularity of spacing and by grouping in two sets, due to normal faulting concomitant with the volcanic history of each island.

The "Bibliography of North American Geology for 1917" has been issued by the U. S. Geological Survey (Bull. 684).

Geology of Canada.—The Geological Survey of Canada has continued its field work during the war with a reduced personnel. The director's summary report for 1917 contains, among others, a paper by W. A. Johnston on a reconnaissance soil survey of the area along the Hudson Bay Railway from The Pas on the Saskatchewan River to Limestone River, within about 75 miles of Hudson Bay. M. E. Wilson has published (Memoir 103) a report on the geology of Timiskaming County, Quebec, and E. L. Bruce has a report (Memoir 105) on the Amisk-Athapapauskow Lake district on the boundary line between Saskatchewan and Manitoba.

Geology of South America. — A. Windhausen of Buenos Aires (*Am. Jour. Sci.*, xliv, 1918, 1) describes the Cretaceous-Tertiary boundary in South America and the San Jorge formation in Patagonia. The paper is illustrated with a palæogeographic map showing land and sea south of the parallel of 32° in San Jorge time, regarded as early Tertiary by Windhausen in opposition to the not well founded view of Ameghino that the beds are of Cretaceous age. The San Jorge marine transgression, in the opinion of Windhausen, took place in upper Palæocene or Lower Eocene. Above the marine deposits of this stage a peneplain was developed, giving rise to an unconformable relation to the overlying earliest Patagonian beds carrying the remains of land mammals of Oligocene age.

The Roosevelt-Rondon Scientific Expedition in Northeastern Matto Grosso, Brazil.—Euzebio Paulo de Oliveiro, geologist of the Roosevelt-Rondon Brazilian expedition of 1913-14, has reported on the geology of the district traversed in the exploration of the Rio Roosevelt and other rivers in Brazil (*Expedição Scientifica Roosevelt-Rondon,* Annexo N. 1. Relatorio apresentado ao Sr. Coronel de Engenharia Candido Mariano da Silva Rondon, Chefe da Commissão Brasileira, Rio de Janeiro, 1915). In addition to an itinerary, this report gives an account of rock formations encountered en route in the successive stages of the expedition. In the westward journey across the state of São Paulo to the Rio Paraná and thence westward to the vicinity of the Serra da Bodoquena east of the Rio Paraquay, a country of red sandstones and diabase eruptives was traversed, the geology of which has already been made known by Gonzaga, Lisboa and others. The Rio Paraquay was reached at Porto Esperança. The rocks are chiefly Mesozoic. Oliveira divides them into the Aquidauana and Botucatú sandstones below, both of which are traversed by eruptives, and the sandstones of the Serrinha and the Parecis series above, which are not cut by eruptive rocks. Passing over the notes on the Rio Paraquay, those concerning the Rio Roosevelt, which flows northward into the Madeira, relate to a region of granite and orthogneiss in the middle and lower courses of the river. The cascades of the Rio Roosevelt, states Oliveira, are found on the plateau of Vilhena, and they form the River of Doubt, discovered in 1909 by Colonel Rondon and his assistants during the exploration of the interior of the northeast of Matto Grosso. So, Colonel Rondon tells us, the name "River

of Doubt" was given to a river discovered on Aug. 16, 1909, having 12 m. of width, 0.50 m. of depth, and a medium velocity of 10 cm. per second, subterranean in certain stretches, and almost wholly broken into cascades. The name arose from the fact that Lieutenant Lyra thought it was an affluent of the Goapore, while Colonel Rondon figured it out to be one of the tributaries of the Jamary. The river was chosen by Colonel Roosevelt to reach the Amazon valley.

In a paper entitled *"Regioes carboniferas dos Estados do Sul"* (Serviço geologico do Brazil, Rio de Janeiro, 1918), Oliveira gives a colored geological map of eastern São Paulo and Santa Catharina. This map shows the Cretaceous beds of the Bauru series, and many detailed sections of the Permian series are tabulated in detail. Following I. C. White, Oliveira remarks the means of utilizing the Permian coals by briquetting, by transformation into gas, and by utilization of the powdered coal. No estimates of the quantity of coal which may be thus treated are at present available. Oliveira also furnishes a chapter on the geology of the state of Paraná (Boletim do Ministerio da Agricultura, Industria e Commercio, Rio de Janeiro, 1918).

ECONOMIC GEOLOGY

Adolph Knopf

Principles of Economic Geology.—W. H. Emmons has published a treatise on the *Principles of Economic Geology* (New York, McGraw-Hill Book Co., 1918). The first part of the book gives, in admirably lucid and succinct form, the fundamentals of the science of mineral deposits, in accordance with a modified form of Lindgren's classification. The second part treats separately each of the metals and the more valuable nonmetallic minerals. The examples to illustrate the deposits of the different substances have purposely been chosen almost wholly from North America; this procedure appears to be of doubtful advantage and tends to encourage provincialism. In a book entitled *Principles of Economic Geology* one misses an account of the growth of these principles. Such an account of the history of the science not only would have a high cultural value, but would give the student, for whom professedly the book is mainly written, a proper perspective. As the work now stands, the student will gain the erroneous impression that the principles of economic geology were discovered and developed chiefly by Americans. Despite this feature, which it is perhaps captious to criticize, the volume is undoubtedly the best textbook on the subject that has yet appeared.

Mineral Deposits of South America.—In *Mineral Deposits of South America* Miller and Singewald have assembled all that is known concerning the mineral resources of South America, and have presented it in systematic, well knit, summary form. The book is the outcome of an extended tour of South America by the authors, and though of necessity based largely on the writings of others, it is enriched and illuminated by first-hand observations. Probably the most novel contribution is the establishment of the fact that the marvelously productive tin lodes of Bolivia, which yield annually more than five times as much tin as their nearest competitor, Cornwall, are of a late Pliocene age. Not only tin deposits of the first magnitude, but also copper deposits of the first magnitude, have been formed in South America in recent geologic time; in fact, no continent has nearly so many mineral deposits of the first rank that are geologically so youthful.

Precious-Metal Deposits.—The geology and ore deposits of the Tintic mining district are described by Lindgren and Loughlin (U. S. Geol. Surv. Prof. Paper 107). The ore deposits show a remarkable variation in a horizontal direction. The explanation proposed is that mineralizing solutions, escaping from a monzonite intrusion, deposited gold and copper near the monzonite and lead and silver and zinc farther away. The oxidized ores are of unusual interest because of the great vertical extent of the oxidized zone (the depth to water level being in places 2,400 ft.) and because of the prevalence of copper arsenates derived from the enargite of the primary ore. A separate chapter is given to a description of the many unusual and novel features found.

Bastin and Laney (U. S. Geol. Surv. Prof. Paper 104), in an investigation of the ores of Tonopah, have applied the recently developed methods of studying opaque minerals under the microscope, and have achieved some notable results. Their studies show that a highly complex series of replacements has taken place in the formation of the ores as we now see them.

Zinc Ore.—Loughlin's study of the zinc-carbonate ores of Leadville (U. S. Geol. Surv. Bull. 681) has added much to our knowledge of how deposits of this type have formed. The zinc-carbonate ores of Leadville, it will be recalled, were discovered only very late in the history of the camp (oxidized zinc ore was first shipped in commercial amount in 1910) and it remains somewhat mysterious how such important ore bodies were overlooked for more than thirty years. The geology of the deposits is described in detail in the present report, the special feature being the thorough discussion of the chemical processes by which the carbonate ore was formed by zinc-bearing solutions, which were derived from the oxidation of the sulphides in the primary ores, reacting on limestone.

MINERALOGY AND PETROGRAPHY

Herbert P. Whitlock

The Abbé Haüy Celebration.—As events have slowly but inevitably shaped themselves to the victorious termination of the Great War and the creation of a League of Nations, international scientific relations between this country and the nations of our allies are beginning to be recognized as a factor of no inconsiderable value in the readjustment of *post-bellum* conditions. Inspired somewhat by this thought, as well as by the obvious opportunity for honoring the memory of a justly famous man, the year 1918 was chosen for the celebration of the 175th anniversary of the birth of Réné Just Haüy, the founder of the science of crystallography. The exercises which constituted this memorial took place on Feb. 28 at the American Museum of Natural History, New York, under the joint auspices of the New York Mineralogical Club, the New York Academy of Sciences, and Section E of the American Association for the Advancement of Science. A committee of prominent mineralogists, representative of all parts of this country and Canada under the chairmanship of George F. Kunz, arranged the programme, which consisted of addresses and papers on the Abbé Haüy, his life, work, and influence. These papers, which constitute an important addition to the biographical literature of mineralogy, have been published in the *American Mineralogist* (iii, No. 6) and in the *Bulletin of the New York Mineralogical Club* (ii, No. 3).

War Minerals.—In few phases of the many-sided question of production as affected by war conditions are the requirements more pressing than in that which relates to the supply of raw materials for the manufacture of munitions of war. The ores which produce the metals used in the making of ammunition, ordnance, armor plate, special forgings for motor parts, as well as those essential to the production of the tools and apparatus for the making of these, have recently acquired the designation of war minerals. Recognizing the importance of these basic elements of our war machinery, an importance so little realized by the public, the American Museum of Natural History and the New York State Museum at Albany have placed on exhibition series of ores, intermediate products and finished munitions of war, with a view to visualizing as far as possible the steps in the development of war munitions from the ores to the finished products and to emphasize the need of developing adequate domestic sources of supply of ores of the rarer metals, such as mercury, nickel, manganese, chromium, tungsten, vanadium and molybdenum.

New Minerals.—The advance in mineralogy during the year has been marked by the addition of a number of new species to the constantly growing list. It is significant that with two exceptions these new additions represent American occurrences, a fact which indicates that research mineralogical work in Europe has been relatively suspended under the war conditions.

A new hydrated magnesium aluminium silicate in the Kaolin division has been found in Coleraine Township, in the Black Lake area, Quebec, and named from its locality *coleraineite.* A highly ferriferous pyroxene closely related to hedenbergite and found in the Collbrand contact of the Suan Mining Concession in Central Korea has now been shown in its true relation to the pyroxene group; this mineral, which was previously described as ilvaite, has been given the name *collbranite* after the Messrs. Collbran, developers of the mine. The crystalline limestone at Crestmore, Riverside County, Cal., has yielded two new hydrous calcium silicates, named from the locality *crestmoreite* and *riversideite,* respectively. A new zeolite from Iceland has been named *flokite* after Floki Vilgerdarsen, the Viking discoverer who gave Iceland its name. A new lead-antimony sulphide of the jamesonite group has been found at two localities in Idaho and Montana, and has received the name *mullanite,* after Capt. John Mullan, who was associated with Mullan, Idaho, one of these localities. A sulphide of tungsten has been found at the Emma mine, Salt Lake County, Utah, which constitutes a new compound of this metal, related chemically to molybdenite; this new mineral has been named *tungstenite.*

Petrography in Its Relation to the War.—Since the establishment of the Carnegie Geophysical Laboratory in Washington in 1904, there have come to be associated with the research work of this institution a group of specialists in the optics of the microscope and other instruments of precision who have gained international reputation of a high order in their chosen field. These experts in the construction and testing of lenses have placed their knowledge and experience at the service of the Government, and are now detailed to the plants of the various manufacturers of optical instruments who have taken up the difficult task of replacing German optical glass by an American product to be used in field glasses, range finders and other service instruments. The patriotic service of this group of petrographers in superintending the manufacture of American optical glass and testing the quality and accuracy of the lenses produced from it is of a high value and difficult to estimate. That this is only one phase of the aid that is being placed at the disposal of the Government by workers in the field of pure science, clearly demonstrates the practical utility of those branches of research which have hitherto been considered by the unthinking as merely academic.

New Publications. — A *Manual of Geometrical Crystallography* by G. Montague Butler (New York, Wiley, 1918) contains in a small compass the essentials of the subject from the point of view of an educator teaching crystallography as an aid to mineralogy. The subject matter very largely takes the form of a series of definitions of terms, a treatment no doubt imposed by the limited size of the volume.

In *A Textbook of Precious Stones for Jewelers* (New York, Putnam, 1918), Frank B. Wade has produced a very readable, as well as an extremely useful, book and one which should appeal to a large class of readers, including not only jewelers but all of the public interested in gems. Freed from the technicalities which so often characterize textbooks on gems, yet very sound in the scientific principles important to the dealer, this volume will no doubt fill a place long vacant on the book shelf of the busy man of trade. As in Mr. Wade's former work (*A. Y. B.*, 1916, p. 599), he has shown a specialized knowledge of the technology of gems from the point of view of the jeweler and lapidary which gives to his present volume a very considerable value to the man who does not go behind the counter.

Waldemar T. Schaller has collected and published (*Mineral Resources of the United States,* 1917, Part II, Washington, 1918), a list of "Gem Names," which will prove of considerable value as a means of identifying the mineral species of gems to which obscure and misleading names are all too frequently assigned. The list is published in two parts: the first, consisting of about 825 titles, gives the synonyms alphabetically arranged with the corresponding mineral species, and the second part gives the same synonyms grouped under the mineral species.

EARTHQUAKES AND VOLCANOES

Harry Fielding Reid

Earthquakes. — Three important earthquakes are to be recorded for the year. The city of Guatemala was destroyed by earthquakes in December, 1917, and January. The shocks began the middle of November and continued with interruptions for more than two months. A sharp shock was felt on Christmas Eve. The next evening at 10.30 p. m., and again a half-hour later, two shocks occurred which overthrew many houses and drove all the inhabitants of the city into the streets. Heavy shocks were felt at 2 a. m. on Dec. 27, at 3 p. m. on the 28th, and 4.50 p. m. on the 29th. On Jan. 3, at 10.30 p. m., and the 24th, at 7.20 p. m., shocks even stronger than the earlier ones completed the ruin. Two or three hundred persons are said to have lost their lives. The great damage done to the city seems due to the fact that nearly all the buildings, including the churches, were built of adobe, which offers very little resistance to the vibrations; the few frame, or well built stone or concrete buildings suffered but slightly. Later shocks occurred on Feb. 26 and in October.

The towns of San Jacinto and Hemet, in southern California, were destroyed by a severe earthquake on April 21 at 3.32 p. m.; only a few of the more substantial buildings in these towns were not seriously damaged. Landslides occurred in neighboring mountains, concrete roads and irrigating canals were broken, and cracks appeared in the ground. The disturbance was felt over a large part of southern California and in adjoining regions of Arizona. The cause seems to have been a movement on the San Jacinto fault. It is interesting to note that this earthquake was almost an exact replica of the shock of Dec. 25, 1899, at the same place. Many lighter shocks, both before and after the strong earthquake, are reported from the same general region, on Nov. 19, 1917, March 5, 6, 21 and 30; many after-shocks occurred during the immediately succeeding days, and other shocks on May 16 and 28, June 6, 14, 16, 20 and 21 (2), and July 7 and 9.

A very severe earthquake occurred on Oct. 11, at 10.14 a. m., Atlantic standard time. Its origin was submarine, five or 10 miles off the northwest corner of Porto Rico and Santo Domingo. It caused much destruction of property in the western part of the island. It was felt for a distance of 250 miles from the origin, east and west. Tidal waves added to the destruction in the northwestern part of Porto Rico. More than 100 people are reported to have lost their lives, and the damage to property was over a million dollars. Minor shocks were frequent for a month; two of them, on Oct. 24 and Nov. 12, were especially strong. After the latter date the shocks rapidly decreased in frequency and in intensity.

A pretty sharp shock was felt at Chicoutimi, 110 miles northwest of Quebec, Canada, on Nov. 4, and a light shock in the eastern part of Maine on Jan. 14. A shock strong enough to overthrow chimneys occurred in southwestern Maine at 12.12 a. m. on Aug. 12; the origin was near Norway, and the shock was felt over an area of about 15,000 sq. miles. A slight shock was felt at Glens Falls, N. Y., on Oct. 1, 1917. On April 9, at 9.09 p. m., a shock of moderate intensity, central near Luray, Va., was felt over 110,000 sq. miles, including parts of Virginia, West Virginia and Maryland, and was even reported slightly felt in Pennsylvania; a preliminary shock was felt near the origin on April 9, and an after shock on April 16. A slight shock occurred in southeastern Virginia on April 19. Light or moderate shocks are reported from eastern Tennessee, June 21; southern Illinois, Feb. 17; western Wyoming, Dec. 12, 1917; Revelstoke, B. C., Feb. 5; northwestern Montana, northern Idaho and northeastern Washington, March 11; Yakima, Wash., Feb. 28; Walla Walla, Wash., March 1; eastern Washington, April 18; and western Washington, Nov. 12 and 13, 1917, and May 7, June 20.

Shocks are reported from Eureka, northern California, on Feb. 23, March 2, April 16, July 14 and 21, and Aug. 20; somewhat further south, on Nov. 5, 1917; in eastern California, on Feb. 11 and 28, March 12 and 23, May 13 and 24, June 3, July 27, and Aug. 12; in the neighborhood of San Francisco and a little further south, on Oct. 2, 11 and 26, 1917, and June 29 and 30, July 12, 14 and 20, and Aug. 3; near Santa Monica Bay, southern California, on March 6 and 8; at Tejon Pass, on April 14 and 17; and at Mt. Wilson, on July 25. Many light shocks have been felt in Imperial Valley, but only one, on April 30, was strong enough to throw goods from shelves; this shock was followed by several after shocks during the next two or three days. Lighter shocks occurred on Oct. 14 and 16, Nov. 12, Dec. 8 and 20, 1917, and Jan. 16, April 22, May 22, June 4 and 12, July 24, and Aug. 1, 17 and 24. Flagstaff, Ariz., reports a shock on April 28, and central New Mexico a pretty sharp shock on May 28; chimneys were overthrown at Cerillos; the area shaken was small, about 7500 sq. miles.

Volcanoes.—Lassen Peak threw out large volumes of smoke and ashes on Dec. 12, 1917, but in general it has been very quiet. The general level of the lava in Kilauea was high in 1917 and continued to rise early in 1918, the lava lake overflowing its bank on Feb. 23; since then, there have been irregular fluctuations with a general tendency toward depression, although the general level is still high. The volcano Irazu, in Costa Rica, the last eruption of which was in 1726, sent out great quantities of smoke and ashes during the first three months of the year, but no violence is reported. In the February number of the *National Geographic Magazine*, there is a thrilling description of the region about Mt. Katmai in Alaska. This volcano became extremely violent in June, 1912, and has been active ever since. Katmai is described as the greatest active volcano in the world, its crater being three miles in diameter, slightly greater than that of Kilauea. Innumerable vents and fissures are discharging great quantities of steam and gases; they occur principally in the valleys and cover an area of about 70 sq. miles.

METEOROLOGY AND CLIMATOLOGY

Charles F. Brooks

General Meteorology.—The most thorough American treatise on general meterology that has appeared for many years is W. J. Humphreys' "Physics of the Air" (*Jour. Franklin, Inst.*, clxxxiv, 1917, clxxxv, 1918). The part on mechanics and thermodynamics has been published in instalments, and a part on optics is ready for publication. Unlike Prof. W. I. Milham's more general book (MacMillan, 1912-1917), this work is intended to be used as a textbook by advanced students. Professor Humphreys starts with fundamentals and develops the physical and meteorological formulae he uses. The book is highly original. One noteworthy feature is the thorough discussion of winds, which are classified according to the immediate conditions that initiate or materially modify them. The cloud photographs are excellent. A smaller book, *Introductory Meteorology* (New Haven, Yale University Press, 1918), for use as a text in the meteorology courses in the Students' Army Training Corps, was prepared by Weather Bureau officials at the request of H. E. Gregory, National Research Council. Under the direction of Lieut-Com. Alexander McAdie, the Navy has issued a very useful *Manual of Aerography* (Government Printing Office, 1918). It contains many valuable fundamental data, formulae and tables, and there are brief discussions of the major branches of meteorology.

The Weather Bureau and Signal Corps.—Since the entry of the United States into the war, the Weather Bureau and the meteorological section of the Signal Corps have been working hand in hand. The Weather Bureau has supplied men and instructors for the meteorological service, and the Signal Corps in return has given some help at the new Weather Bureau kite stations and in other ways. The Weather Bureau and the Signal Corps have established some 30 new aerological stations in the United States, most of which now report twice daily by telegraph to the central office of the Weather Bureau. W. R. Gregg, in charge of the Weather Bureau aerological stations, has published papers on the "Turning of Winds and Altitude," with rules for forecasting winds aloft (*Mo. Wea. Rev.*, xlvi, 1918), on "Mean Values of Free-Air Barometric and Vapor Pressures, Temperatures and Densities over the United States" (*ibid.*), and "Free-Air Data at Drexel Aerological Station" (*Mo. Wea. Rev. Suppl.*, Nos. 8, 9, 10, 11, 12, 1918). On account of the increasing importance of detailed knowledge of local storms, the Weather Bureau has been paying more attention to the collection of thunderstorm, hail and tornado data. Descriptions of individual storms are published monthly (*Mo. Wea. Rev.* and *Clim. Data of the U. S. by Sections*).

Aeronautical and Military Meteorology.—R. DeC. Ward's article, "Meteorology and War-Flying" (*Mo. Wea. Rev.*, xlvi, 1917; *Am. Geogr.*, viii, 1918), embodying three lectures given aviators at ground school, is a well written and comprehensive treatment of the subject. It contains full references to the literature. Further notes have appeared in the *Geographical Review* (vi, 1918). W. J. Humphreys's paper, "Holes in the Air," and Capt. C. J. P. Cave's article, "Some Meteorological Conditions which Increase the Danger of Flying," have been published in the Navy's *Manual of Aerography* (see *supra*). Aviators have found that fogs and stratus clouds present difficulties equal to those experienced in storms (*Sci. Am.*, cxix, 1918; *Aerial Age*, vii, 1918). Most of the 13 postal flights missed on the New York and Washington mail route in the first month were not attempted because of fog. A thunderstorm prevented one flight (*ibid.*). Data from the Bureau of Lighthouses and Weather Bureau stations show that the coast of Maine is the foggiest part of the United States and that the Pacific coast comes second. At Petit Manan, Me., it is foggy 19 per cent. of the time, and at Point Reyes Light, Cal., 15 per cent. (*Mo. Wea. Rev.*, xlv, 1917).

In military meteorology, R. DeC. Ward has continued his extended series of interesting articles on the weather factor in the war (*Sci. Mo.*, vi, vii, 1918; *Jour. Geog.*, xvi, 1918). Miss M. M. Welch has published a bibliography of "Recent Publications Relating to Military Meteorology" (*Mo. Wea. Rev.*, xlvi, 1918). Many of the recent artillery pamphlets and books contain new discussions on corrections of range and deflection for variations due to atmospherical conditions (*cf.* Danford and Moretti, Yale University Press, 1918).

Agricultural Meteorology. — Two phenological papers published by the Department of Agriculture are the results of several years of interlocking investigations. One by Dr. A. D. Hopkins is entitled, "Periodical Events and Natural Law as Guides to Agricultural Research and Practice" (*Mo. Wea. Rev. Suppl.*, No. 9, 1918). Dr. Hopkins's important contributions are (1) the mapping of climatic areas that could be used most profitably for the extension of spring-wheat culture, and (2) the predetermination of proper dates for seeding winter wheat anywhere in a normal year. O. E. Baker, C. F. Brooks and R. G. Hainsworth are the authors of *A Graphic Summary of Seasonal Work on Farm Crops;* 58 of the 81 maps show in detail the seasonal progress of planting, working and harvesting operations on the important crops of the United States. From a study of these maps it is evident that the weather is the prime factor controlling the dates of the different crop operations, but that conflicting labor requirements of different crops on the same farm and seasonal changes in the market are responsible for important modifications.

In forecasting minimum temperatures on nights when the wind is light, J. Warren Smith (*Mo. Wea. Rev.*, xlv, 1917) and E. S. Nichols (*ibid.*, xlvi, 1918) have been successful by considering the minimum temperature as a function of the evening relative humidity and dewpoint. For each place there are constants which must be determined before the minimum temperatures can be forecast in this way. The fundamentals of such forecasts have been covered in H. H. Kimball's important paper on nocturnal radiation (*ibid.*, xlvi, 1918), and in F. E. Fowle's extensive study of "Water-Vapor Transparency to Low-Temperature Radiation" (*Smithson. Misc. Coll.*, lxviii, No. 8, 1917). As is to be expected, there is a linear relation between the vapor pressure and the radiation: high vapor pressure, small radiation, and *vice versa.* T. A. Blair, following up earlier work, has published a mathematical paper on "Partial Correlation Applied to Dakota Data on Weather and Wheat Yield" (*Mo. Wea. Rev.*, xlvi, 1918). D. A. Seeley has written a paper on the "Relation between Temperature and Crops" (Mich. Acad. Sci., 19th Report, 1917).

Weather Forecasting.—Our inability to forecast the coming of such an extreme winter as that of 1917-18 in the eastern United States, and its sudden ending, has brought us again to the realization that for progress we must discover the dynamical background of our weather (*Geogr. Rev.*, v, 1918; *Mo. Wea. Rev.*, xlv, 1917; xlvi, 1918). A. J. Henry, when reviewing the months in which he has been supervising forecaster, has discussed in detail the various aspects of our weather forecasting, and especially the possibilities of using data from the Pacific (*Mo. Wea. Rev.*, xlv, 1917, xlvi, 1918). Ellsworth Huntington has shown that sudden changes in pressure gradients are connected in some unknown way with changes in the sun's visible disk (*Geogr. Rev.*, v, 1918; *Mo. Wea. Rev.*, xlvi, 1918). C. G. Abbot has written a popular resumé of the "Sun and the Weather" (*Sci. Mo.*, v, 1017), and concludes that for further progress we need daily values of the solar constant. These are now being observed and computed at Calama, Chile (*Proc. Nat. Acad. Sci.*, iv, 1918). F. H. Bigelow has contributed *A Treatise on the Sun's Radiation and Other Solar Phenomena* (Wiley, 1918).

The oceanographical aspect of the problem (see also *Oceanography, infra*) was considered at an international conference at the semi-centennial of the founding of the University of California in March, 1918. Plans were considered for collaboration of Japan, Canada and the United States in making a thorough investigation of the meteorology and oceanography of the North Pacific with a view to making long-range forecasts. In January, 1918, the Weather Bureau began to publish mean water temperatures on its monthly meteorological maps of the North Atlantic (*Mo. Wea. Rev.*, xlvi, 1918). Since September, 1917, observers on the Havana-Key West car ferries have been taking several observations of water temperatures in the Gulf Stream daily. Some isolated problems studied are Canal Zone northers, and, by T. A. Blair, the temperature opposition between San Diego, Cal., and Jacksonville, Fla., which is well marked in some months (*ibid.*, xlvi, 1918).

Climatology.—R. DeC. Ward has revised his book, *Climate, Considered Especially in Relation to Man* for the second edition (New York, Macmillan, 1918). Discussions of local climates were published by J. G. Mosier for Illinois (Ill. Agr. Exp. Sta., 1918), by D. A. Seeley for Michigan (Mich. Agr. Exp. Sta., 1917) by Roscoe Nunn for Tennessee (*Resources of Tenn.*, viii, 1918), and by S. D. Flora for Kansas (*Trans. Kans. Acad. Sci.*, xxviii, 1918).

TERRESTRIAL MAGNETISM

Daniel L. Hazard

Observations on Land.—Conditions arising out of the war have resulted in a general curtailment of the field work of magnetic surveys during 1918. In the United States the magnetic survey was continued by the occupation of about 100 primary stations, including 30 repeat stations for the determination of the secular change, and 25 auxiliary stations for developing in more detail the distribution in areas of local disturbances.

In Canada the field work was confined to the occupation of a series of 38 repeat stations extending from Sydney to Winnipeg. The Department of Terrestrial Magnetism of the Carnegie Institution of Washington had parties at work as follows: in northern Africa, along the upper Nile and through Eritrea to Massawa on the Red Sea; in Asia, in southeastern and eastern China; in South America, along the Amazon River and its tributaries, and in the Guianas. The work of the magnetic observatories has suffered little interruption. The new observatory of the Carnegie Institution at Watheroo, West Australia, is approaching completion, and it was hoped that its operation might begin at the opening of the year 1919.

Special Investigations.—In order to secure additional data regarding the effect of an eclipse of the sun upon the earth's magnetism, simultaneous observations were made at a number of stations in or near the belt of totality at the time of the total eclipse on June 8 (see XXI, *Astronomy*). The work, planned by the Department of Terrestrial Magnetism of the Carnegie Institution, was carried out by observers of that bureau at four stations in the belt of totality and two stations outside, by observers of the U. S. Coast and Geodetic Survey at three stations in the belt of totality and at the five magnetic observatories of the Survey, by three volunteer observers at stations outside the belt of totality, and by the Canadian and other observatories. The results of the observations are published in the *Journal of Terrestrial Magnetism* for September, 1918. Upon the completion of the eclipse work, four observers of the Carnegie Institution and two of the Coast and Geodetic Survey carried out a series of observations in the vicinity of Pikes Peak, Col., to study the effect of altitude on the earth's magnetism. Nearly simultaneous observations were made at stations near the top of the mountain and at much lower altitudes around the base.

Observations at Sea.—The *Carnegie*, after being out of commission at Buenos Aires from March to November, 1917, because of the war, left that port in December on her homeward cruise. Going around the Horn and along the west coast of South America to the Panama Canal and then through the Gulf of Mexico, she arrived at Washington on June 10, where she was put out of commission for the duration of the war. In the course of the cruise in the Pacific, two loops to the west were made to fill in areas not previously traversed. The preliminary results of the magnetic observations secured on this cruise have been published in the numbers of the *Journal of Terrestrial Magnetism* for March, June and September, 1918.

Publications.—The U. S. Coast and Geodetic Survey has published the results of field observations made during 1917 and the results for the five magnetic observatories for 1915 and 1916. The University of Tokyo has published in the *Journal of the College of Science* a report by T. Terada on an investigation of "Rapid Period Variations of Terrestrial Magnetism" covering a period of four years from 1910 to 1914. For the purposes of the investigation special highly sensitive variometers were designed by Professor Tanakadate and Dr. Kadooka, including a vertical-force variometer with quartz-fibre suspension, which showed much greater stability than the more usual balance form of suspension. The New Zealand Lands and Survey Department has published the results of a magnetic survey of the Dominion and some of the outlying islands for the epoch June 30, 1903, by C. C. Farr.

Among the notable articles in publications may be mentioned: S. J. Barnett, "Magnetization by Rotation" (*Science*, Sept. 27, 1918); L. A. Bauer, "Relation between the Secular Variation of the Earth's Magnetism and Solar Activity" (*Terres. Mag.*, March and June, 1918); L. A. Bauer, H. W. Fisk and S. J. Mauchly, "Results of Magnetic and Allied Observations during the Solar Eclipse of June 8, 1918" (*ibid.*, Sept., 1918); S. Chapman, "On the Times of Sudden Commencement of Magnetic Storms" (*Proc. Royal Soc.*, June 15, 1918) and "An Outline of a Theory of Magnetic Storms" (*ibid.*, No. A 666); C. Chree, "Terrestrial Magnetism in Relation to Mine Surveying" (*Trans. Inst. Min. Engrs.*, lv, pt. 4); Daniel L. Hazard, "Results of Observations Made by the U. S. Coast and Geodetic Survey at the time of the Solar Eclipse of June 8, 1918" (*Terres. Mag.*, Sept., 1918); W. F. G. Swann, "On the Magnetic and Electric Fields which Spontaneously Arise in a Rotating Conducting Sphere" (*ibid.*, Dec., 1917); Paul L. Mercanton, *"Etat magnétique des terres cuites préhistoriques"* (*Bull. Soc. Vaudoise Sci. Nat.*, lii, No. 194).

GEOGRAPHY

PHYSICAL GEOGRAPHY OF LAND AREAS

WALLACE W. ATWOOD

The Field of Physical Geography.—The Great War continues to have a profound influence upon the services and research work of geographers. Just at the close of 1917 there appeared D. W. Johnson's work on *Topography and Strategy in the War* (New York, Holt). Early in 1918 a handbook on the geography of northern France was issued. Those engaged in training officers for the American army have emphasized in all their instruction the significance of relief features in each of the great campaigns. The closing of the Dardanelles is now seen to have been one of the most important of the factors which led to the collapse of Russia. Nine-tenths of all the shipping from the rich, productive region of southern Russia formerly passed through the Sea of Marmora. That route is the one exit from Russia which is free from ice throughout the year. When farm products could not be shipped or ammunition and other war supplies imported, the Russian army gradually became helpless. The closing of the Dardanelles was a great strategic move on the part of the Central Powers.

The escarpments east of Paris have served as natural defenses to that city. The German army has sacrificed hundreds of thousands of men in attempting to storm the great east-facing cliff near Verdun. The importance of Chemin des Dames line and of Laon was due to their topographic locations. Each river valley, each hill, each lowland plain has been the subject of most careful study by those engaged in conducting the campaigns and by those instructing American officers in the military significance of topography.

In home fields a special application of the principles of physiography has been made in the search for manganese. That metal is now needed in larger quantities than ever before for the manufacture of steel. The distribution of some of the manganese deposits in our southern Appalachian region is definitely related to physiographic surfaces developed by running water. The ores are associated with old zones of rock disintegration.

Physical Geography of the Army Cantonments.—During the year special reports have been published by the U. S. Geological Survey on the following camps: Dodge, Grant, Sherman, Mills, Upton, Lee, Langley Field, and Devens. The report in each case is published on the back of a topographic map of the camp and its environs. Each account describes and explains in non-technical language the physical features shown on the map. Campbell and Alden of the U. S. Geological Survey are the authors of certain of these reports; Lees prepared the account of Camp Dodge and R. D. Salisbury the report on Camp Grant, and the writer has had charge of the studies of Camp Devens district. Reports may soon be expected on the other national cantonments and aviation fields. (See also IX, *State Geological Surveys.*)

Topography of Northern France.—The *Handbook of Northern France*, prepared by William Morris Davis (Cambridge, Harvard University Press), is a remarkably clear description and explanation of the topographic features of the western war front. A large number of drawings, many of which show the geologic structure, are given. The book was written especially for the American army officers. In many instances the military significance of the topographic features is referred to. The origin of the great east-facing escarpments that form the natural defenses of Paris is clearly set forth, and in a number of instances details in battle plans are shown in relationship to topography. Professor Davis is now engaged on a similar work in which he will describe and explain the topography of western Germany.

Environs of Camp Grant.—A special study of the geography at and near Camp Grant in northern Illinois, made by Rollin D. Salisbury and Harlan H. Barrows, has appeared as a bulletin of the Illinois State Geological Survey. A careful description is given of the topographic features, and special emphasis is placed upon the military significance of certain relief features. The hills and valleys near the camp are used by officers in planning various military manœuvres, and the authors have so prepared their report that the information needed by a military man, regarding the streams, ground water, roads and road material, water supply and timber, is made easily available. The authors present also a statement of the influence of geographic conditions upon man in the region about Camp Grant. Here they have sketched the early history of settlement from the time of the Black Hawk War through the days of the early pioneers to the establishment of farming, manufacturing and markets. In this, the closing chapter, they point the way to a broad study in the relationship of physical geography and climate to man and his occupations.

Physiography of the Southern Rocky Mountains.—A paper on the "Early Mesozoic Physiography of the Southern Rocky Mountains," by Willis T. Lee, published in the *Smithsonian Miscellaneous Collections*, presents a new application of the principles worked out through a study of physical geography. In the southern Rocky Mountain province and in the plateau region just to the west, there are certain gypsum and limestone beds containing fossils, and also widespread deposits of non-fossiliferous sandstones which from their structure appear to be of Æolian origin. The gypsum deposits indicate aridity. They rest where an inland sea once existed, and they were precipitated as those sea waters evaporated. The wind-blown sand also indicates desert conditions. The sandstone formation is a series of sand dunes cemented into rock.

In his studies of this portion of the Southwest, Lee has found it possible to work out a very ancient physiography in which there were mountain ranges which do not exist today and deserts where now there are no deserts. Thus, through an appreciation of the principles of physical geography, he has been able to disclose a bit of geologic history.

Surface Features of Southeastern Wisconsin.—In a report on the "Quaternary Geology of Southeastern Wisconsin" (U. S. Geol. Surv. Prof. Paper 106), William C. Alden has presented a most exhaustive treatment of the topography and geography of that region. Several years were spent in careful and detailed field studies, and the report represents equally careful preparation. Certain of the surface features are due to the underlying rock structure, but almost everywhere the mantle of glacial drift gives character to the country. Preceding the period of glaciation, the streams had dissected the rock surface, peneplains had been developed, and cycles of erosion passed. The record of Pleistocene ice sheets which invaded the region from the northeast includes the pre-Kansan, Kansan, Illinoian, and Wisconsin stages. During each one of these stages, the region suffered intense abrasion by a rock-shod continental glacier, and upon the retreat of each ice sheet a fresh mantle of drift was left on the country. The distribution of drumlins made by the Green Bay Lobe of the Wisconsin Sheet is remarkably well shown on one of the many excellent maps that accompany the report. The streams from the melting glaciers deposited vast quantities of sands and gravels which have proved to be of great economic importance as building material, used especially in concrete construction in the large cities near the southern end of Lake Michigan. So far as the physical geography of Lake Michigan since the disappearance of the last ice sheet has affected the region under consideration, that history is given in the report.

Moraines in Tierra del Fuego.—In a paper published by the Minister of Agriculture of Argentina, Guido Bonarelli has presented, along with a geological report, a description of the moraines associated with the southern end of South America. A series of mountain glaciers existed in that region during the last great ice age. These glaciers formed in the Andes Mountains and moved eastward through mountain valleys. They completely occupied the Strait of Magellan and other fjord-like passageways in that vicinity. The moraines indicate that the glaciers pushed eastward beyond the present shoreline of the continent into the Atlantic Ocean.

Physical Geography and Engineering.—A report by the writer on "The Relation of Landslide and Glacial Deposits to Reservoir Sites in the San Juan Mountains of Colorado" has appeared as a bulletin of the U. S. Geological Survey. This work embodies a direct and practical application of the study of physical geography to problems in engineering. The surface formations near several of the great reservoirs in the mountains are described. The costly errors that have been made in the construction work are shown to be due to a failure to recognize the nature of certain landslide and glacial deposits in the canyons. The report is based on detailed studies in the field.

Other Contributions.—"Eskers in the Vicinity of Rochester, New York" by A. W. Giles (*Proc. Rochester Acad. Sci.*) includes, with a descriptive text, a series of topographic maps of some remarkable eskers. "Terrace Gravels of the Northern Great Plains" by Arthur J. Collier and W. T. Thom, Jr. (U. S. Geol. Surv. Prof. Paper 108-J), is based on field studies in Montana and southern Alberta, and gives in some detail the history of stream deposition and stream erosion in the country east of the Rocky Mountains near the Canadian line. "The Northward Extension of the Physiographic Divisions of the United States" by W. N. Thayer (*Jour. Geol.*, xxvi) assumes a distinctly geologic basis for the subdivisions suggested for the northern part of the continent, but it does not recognize certain important features earlier pointed out by D. B. Dowling in *An Outline of the Physical Geography of Canada*. Eugene W. Shaw (U. S. Geol. Surv. Prof. Paper 108-H) has presented, in a geological study of the Pliocene period in northern and central Mississippi, a summary of the physiography of that portion of the Coastal Plain. The record of physiographic changes is related to the history of physiographic changes in the neighboring Appalachian province.

OCEANOGRAPHY

G. W. Littlehales

General Advances.—Although the state of international relations has of late precluded the sending forth of expeditions on the sea for purposes of oceanographical investigation, the annals of oceanography have nevertheless received accessions of importance from the marine laboratories and oceanographical institutes, emphasizing, as in the results emanating from the Marine Laboratory of the Carnegie Institution at Dry Tortugas and from the Scripps Institution of the University of California at La Jolla, the necessity of interpreting the living beings of the sea in the light of their ordinary conduct under natural conditions; resulting in improvements in the instruments of observation, as in the communications of Thuras to the Washington Academy of Sciences in December, 1917, and March, 1918, in relation to measurements of the density and salinity of sea water under the auspices of the Interdepartmental Committee on Oceanography (*A. Y. B.*, 1917, p. 500); or summing up the extent of oceanographical exploration, as in the *Okeanographia* of Jules de Schokalsky, professor emeritus in the Russian Naval Academy at Petrograd.

Of greatest significance, however, is the appeal of oceanography for international coöperation, seen on all sides in the recognition by oceanographers of the fundamentally worldwide and hence continental and intercontinental nature of the phenomena, the national and international character of the scientific and economic results to be developed, and the necessity for the application of resources that come only at the call of nations acting in concert."

Meteorological Investigations. — Oceanographers believe that, besides trying to predict the extremely variable state of the atmosphere, meteorologists should give attention to the conservative influence in meteorology exercised by the ocean, where changes may be observed in the surface waters months before their effect on our weather becomes manifest. It is, therefore, a welcome sign in the meteorological aspects of oceanography that several countries have started to issue monthly charts giving the actual state of the surface temperature of the North Atlantic, or rather of those parts which lie along the principal ship routes, and also to work up portions of the great stores of material contained in the log books received from oceangoing merchant vessels. Pioneer work of this kind has already been completed by Nansen and Helland-Hansen, whose results, presented by Nansen before the Washington Academy of Sciences in January, 1918, prove that unmistakable changes in the surface temperature of the North Atlantic occur from year to year as an increase or a decrease prevailing over vast areas, if not over the whole ocean. The International Council for the Study of the Sea, whose seat is at Copenhagen, has employed the opportunity offered by the temporary interruption of regular research at sea to take up this kind of work on a still broader scale, with a view to deducing the average hydrographical conditions of certain representative areas for the period 1900-13, as well as the departures from these values for each month of the same period. In this work the excellent observations extending over some 40 years compiled by the Danish Meteorological Office have proved particularly valuable. (See also *Meteorology and Climatology, supra*).

Biological Investigations. — Recent oceanographical studies of the nature of those that find an audience among botanists and geologists are collected in a book by H. B. Guppy, entitled *Plants, Seeds, and Currents in the West Indies and Azores* (London, 1917), which, while of special concern to those who are interested in the geological history of the West Indian oceanic basins and the relationships of the floras and faunas of their perimeters, undoubtedly contributes toward a solution of palæontological problems and enables them to be viewed from the various angles necessary to their ultimate proof or disproof. This same student of sea drift and strand floras as influenced by ocean currents has published, in the *Observations of a Naturalist in the Pacific*, a similar study of plant dispersal in that region.

CARTOGRAPHY

W. L. G. JOERG

Map of Europe and the Near East, 1:1,000,000.—Of the fundamental map of Europe and the Near East on the scale of 1:1,000,000 compiled by the Royal Geographical Society of London under the direction of the General Staff (*A. Y. B.*, 1915, p. 607; 1916, p. 608; 1917, p. 591), 15 new sheets have been issued since our last report, bringing the present total up to 61. The new sheets relate mainly to northern Europe and northern Arabia. They are: R-37 and 38 (Rinda and Kanin), Q-33 and 34 (Bodö and Lulea), Q-37 and 38 (Arkhangelsk and Mezen), P-29 and 30 (Thorshavn and Lerwick), P-37 and 38 (Kargopol and Ustyug), O-29 (Stornoway), O-30 (Aberdeen), O-31 (Stavanger), O-32 (Kristiania), L-30 (Bordeaux), J-39 (Resht), I-37 (Damascus), H-36 (Cairo), H-37 (El Djauf), H-38 (Basra). An important new feature is the publication of an edition with physical coloring in greens and browns to indicate elevation (so-called "layer tints"). The map heretofore showed relief in contours only. It now takes on the aspect of the International Map of the World in 1:1,000,000, of which this method of representation was a cardinal requirement. The physically colored sheets, most of which have already been listed in the contour edition, cover Asia Minor, Syria, northern Arabia, Mesopotamia, Armenia, western Persia, and the Caucasus. They number 15, as follows: J-35, I to K-36, H to K-37, H to K-38, and I to K-39.

Ethnographic Maps of Europe.—The war has naturally brought a flood of racial maps of Europe. Among the best are perhaps three maps edited by A. Dardano and published by the Istituto Geografico De Agostini (Novara, with text, 1917): Europe, 1:10,000,000; Central Europe, 1:3,000,000; Balkan Peninsula, 1:3,000,000. Technically the maps are noteworthy for their perfect legibility; the colors, while strong, are so transparent that they do not obscure the excellent relief hachuring printed in gray underneath. The color scheme is well chosen to suggest racial relationships. The names of countries are given in their native form, as Magyarorszag (Hungary) and Memalik-i-Osmaniye (Ottoman Empire). The map of Europe closely follows the similar map in Debes' *Handatlas* (*A. Y. B.*, 1913, p. 640) but is original for Armenia, Iran, and North Africa. On the map of the Balkans, Serbian territory is possibly too much restricted in the southeast to the advantage of Bulgarians and Albanians.

A moderate Serbian point of view in the representation of this region is brought out on an excellent ethnographic map of the Balkan Peninsula, 1:3,000,000, by Prof. Jovan Cvijic, the leading Serbian geographer (*Geogr. Rev.*, May, 1918). A valuable feature is the subdivision of the Serbo-Croats according to religion—Catholic, Greek-Orthodox, and Moslem. A suggestive map of the zones of civilization of the same area (*ibid.*, June, 1918) supplements the first and represents a factor rarely mapped but of importance as a corrective of the purely linguistic criteria commonly adopted in the classification of nationalities.

A notable ethnographic map of Hungary in 1:2,000,000 by B. C. Wallis appeared in four parts in the *Geographical Review* (Aug.-Nov., 1918). Its merit lies in the original method used for representing nationalities (*cf. A. Y. B.*, 1916, p. 609), which possibly better than any other reflects actual conditions. Supplementary maps of relief and population density on the same scale afford the proper background for evaluating the distribution of the various races and the topographical features controlling it.

Map of the Boundary between Eastern and Western European Civilization.—An interesting publication, although subscribing somewhat too patently *ad maiorem Germaniae gloriam*, is the map of Europe by Paul Langhans, 1:10,000,000, in *Petermanns Mitteilungen* (Gotha) for January, 1917, representing the boundaries of certain cultural elements distinguishing Western from Eastern European civilization. Among these are the eastern limit of Frankish house types, and the boundaries between the use of the Julian and Gregorian calendars and between Gothic and Latin, and Latin and Cyrillic, printing types. These elements are shown on a background of racial distribution and religious adherence, the whole resulting in a somewhat complex picture.

Atlas of Asiatic Russia.—A valuable and timely publication is the official *Atlas of Asiatic Russia* published by the Colonization Bureau of the Russian Ministry of Agriculture (71 plates, Petrograd, 1914). The bulk of the maps are on a scale of 1:12,600,000, or about 20 miles to the inch. On this scale the following features are represented: natural regions, soils, vegetation, ethnography, population density, religions, animal products, mineral resources, communications, posts and telegraphs. There is also a set of maps, covering all of Asiatic Russia, showing the status of land ownership. These are especially valuable because of their scale, 1:3,360,000, or about five miles to the inch—a scale much larger than that of the maps generally available of this ninth part of the land surface of the globe.

Standard Relief Map of the United States.—What may without exaggeration be said to be the best general map of the United States has recently been issued in connection with the *Atlas of American Agriculture* in course of publication by the U. S. Department of Agriculture. The map, on the scale of 1:8,000,000, represents relief in admirable hachuring in gray. Hachures, or fine lines showing the direction of slope, constitute the best method of representing relief on general maps. Contours, the device generally in vogue at present in this country, are admirably suited to large-scale detailed maps, such as topographic sheets. But on general maps they lack the property of being synoptical—they do not convey their message at a glance. This is the defect of the hitherto best general relief maps of the United States, those on the scales of 1:2,500,000 and 1:7,000,000 issued by the U. S. Geological Survey. Even when supplemented by physical tints, contour maps do not have the expressiveness of hachure maps, because contours represent elevations only at given intervals and thus often do not "catch" the salient changes in the vertical configuration of the surface, whereas hachures are drawn precisely only when there are abrupt changes of level. In its representation of drainage the map is also superior; its rivers have character—they are drawn with that firmness of line which allows of instant distinction between essential and nonessential and which only good generalization can give.

Not only in method but also in content the present map is noteworthy. Its utilization of the source materials, some of them only available in manuscript in Government bureaus, is evident throughout. For this reason possibly nowhere else is there to be found, for instance, a better general representation of the Appalachian Plateau or, since the maps made by the Army engineers of the Pacific Railroad Surveys, of the Cordillera.

Cities Map of the United States.—A map representing a fundamental geographical feature, the distribution of man, in a new way is the map of the cities of the United States in 1910, 1:5,000,000, by Mark Jefferson (accompanying *Ann. Assoc. Am. Geogrs.*, vii, 1918). The location of all towns and cities of over 1,000 inhabitants is shown, there being distinctive symbols for every 1,000 population in the 1,000-10,000 group and for every 10,000 in the 10,000-100,000 group, etc. The value of each symbol is suggested by its geometrical figure; thus, triangles are used for cities of 3,000, 30,000, etc., population, squares for 4,000, 40,000, etc. The map brings out the distribution of population in a more intimate way than the customary density maps, which represent areas and often do not account for cities.

EXPLORATION AND GEOGRAPHICAL RESEARCH

CYRUS C. ADAMS

Arctic Exploration. — Vilhjalmur Stefansson reached Herschel Island, near the mouth of the Mackenzie River, early in the winter of 1917-18, was seriously ill there in January, and later suffered from typhoid fever and other complications. When he was able to travel, he started southwest with a party of Canadian Mounted Police and Eskimos, over plain and mountain, to the Porcupine River, Fort Yukon, and, finally, Dawson on the Yukon River. He reached Esquimalt, B. C., in October, after nearly five years in the Arctic.

Stefansson's ship the *Polar Bear* arrived at Nome, Alaska, on Sept. 9 with a large quantity of museum material collected by the leader of the expedition and his men. In March the keel of the *Polar Bear* was so badly damaged by ice in the Barter River that she sank, but she was soon raised and repaired. In March and April five men led by Storkensen sledged from the north coast 150 miles on the sea ice. The purpose was to reach Banks Island if possible, but the westward drift of the ice was so strong that the plan had to be abandoned.

The YEAR BOOK for 1917 (p. 594) announced Stefansson's discovery of his "second" and "third" new lands. His three discoveries of land have been discussed in the *Geographical Review* (March, 1918) in their bearing upon the question whether any land exists in the still unknown area north of Alaska. Stefansson's advance northward from his first new island, together with his remarkable ice trip over Beaufort Sea in 1914 (*A. Y. B.*, 1915, p. 609), his westward loop in 1915 between Banks and Prince Patrick Islands (*A. Y. B.*, 1916, p. 610), and Macmillan's trip to the supposed site of Crocker Land (*ibid.*), all seem to indicate, from the important depths sounded, that no land exists west of the present known limit of the American Arctic archipelago.

Roald Amundsen, who originally planned a Polar drift for 1910, arrived in New York in March to buy supplies for his proposed expedition. According to the *New York Herald* of March 3, and the *New York Times* of March 17, his plan was to leave Norway during the summer, go east along the Siberian coast as far as the De Long Islands, where the De Long Arctic Expedition was wrecked, and there enter the pack for a drift across the Polar basin to the point of probable emergence between Greenland and Spitzbergen. The expedition was to be equipped for seven years, though it was expected to last only four or five years. It was to leave Norway on a new vessel, the *Maude,* which had been built, under Amundsen's supervision, with an egg-shaped hull to withstand ice pressure. Full details of the ship's construction have been published, but there has yet been no announcement of Amundsen's departure.

Cook's Journey "to the Pole."—The Eskimos have a vivid sense of distance and location. In their hunting trips, both on the east and west coasts of Greenland, they sometimes carve relief maps showing the best fiords for fishing or seal spearing and the best routes to them. Holm and other Arctic leaders have published pictures of these remarkable maps, and Hall has told of the usefulness of the maps in guiding natives to destinations involving days of travel. We have every reason, therefore, to rely upon the statements made to Donald B. Macmillan, leader of the Crocker Land Expedition, by Dr. Cook's two Eskimo companions on his alleged journey to the North Pole. Macmillan's data are published in the *Geographical Review* for February, 1918.

Two Smith Sound natives accompanied Dr. Cook throughout his journey. They started from Annoatok, Greenland, in February, 1908, crossed Smith Sound, between Greenland and Ellesmere Island, into Bay Fiord, and sledged up Eureka Sound to the north end of Axel Heiberg Island. Cook and his men then made a 12-mile march on the Polar Sea. Their most northerly point was about 500 miles from the North Pole. They then turned south, following the western shore of Axel Heiberg Island. From that island they sledged southeast to the southern part of Ellesmere Island, and then crossed the land into Gaase Fiord. After further wanderings, all of which are indicated, they passed the winter at Cape Spargo, on the northern shore of North Devon, the large island south of Jones Sound. Game was plentiful and their igloo was well stocked with meat. The following spring the three men sledged back to Etah. Many of the photographs in Dr. Cook's book have been recognized by his companions as taken in the southern regions they visited; for example, Cook's men are represented as near the North Pole in garments they made at North Devon.

The Belcher Islands in Hudson Bay.—An important contribution to our knowledge of Hudson Bay has been made and published by Robert G. Flaherty (*Geogr. Rev.*, June, 1918, 433). The Belcher Islands were long entered vaguely and erroneously on charts of the Hudson Bay Company, but not until now have the real facts about them come to light. The work that finally revealed them was done by Flaherty in 1915-16. His paper includes a map in 1:1,500,000. The following notes are a summary of the more important results.

The larger islands, long and narrow, lie roughly parallel to one another, and extend a little east of north between lat. 55°-57° N. and long. 79°-81° W. The islands cover an area of more than 5,000 sq. miles, having an extreme length, north and south, of 91 miles and an extreme width of 57 miles. Barren hills, the highest of them not more than 480 ft., parallel the islands' trend. There is no tree growth, nor any soil except here and there on valley floors. The rock formations are so well exposed that with a field glass one may easily locate for six miles the white bands of quartzite, the red masses of the ore series, and the black hills of the eruptives. In many shallow lakes ice freezes to the bottom. Those that are not thus frozen contain an abundance of Arctic salmon and whitefish, which supply a large part of the food of the Eskimos living there. Kasegaleek Lake, 43 miles long and about 7½ miles wide, occupies the largest and central island. Safe harbors and anchorages are scattered through the group. The climate differs much from that of the mainland. The temperatures are higher and more equable, but the islands have more overcast skies and fogs and stronger winds. The plant life is typically sub-Arctic. Six varieties of edible berries, highly prized by the Eskimos, are their only vegetable food. The porpoise, right whale, polar bear, six varieties of fox, and birds, including the Canadian goose and its eggs, are the mainstay of life. Since the disappearance of the caribou, the natives, for lack of deer skins, have used the feathered skins of the eider duck and the sea pigeon for clothing. The explorer speaks most favorably of the honesty of these natives and of their skill in handling kayaks and in winter travel.

The Katmai Volcanic Region.—Robert F. Griggs, director of the National Geographic Society's Katmai expeditions, describes (*Nat. Geogr. Mag.*, xxxiii, No. 2, 1918) the fissures and volcanic phenomena in the valleys around Katmai and neighboring mountains. Through countless vents in these valleys enormous volumes of steam are constantly emitted. Griggs says that the total length of all these "smoking valleys," as he calls them, is 32 miles, and the area which they cover is 70 sq. miles. Thousands of vents are in constant action, and "the columns of steam from several of the largest vents, when conditions are right, ascend more than 5,000 ft. in the air; or, under the influence of the winds, trail along the ground for several miles." There are no geysers, because geysers belong to a declining stage of volcanic activity and the Katmai region is in a youthful stage. Novarupta is the greatest of all the vents in the valley. It is not in eruptive rock but in sedimentary sandstone. Its pumice is scattered over an area ten miles in diameter. Griggs says that to find a parallel to these phenomena we must go to the records of geology, "for here we find such a volcanic outburst as the geologist finds recorded in the rocks of the past, but never before has had an opportunity to observe in the world of the present." Griggs's description is illustrated by many striking photographs.

Unexplored Areas of Continental Canada.—Canada still has the largest area of unexplored lands of any North American country. Charles Camsell of the Canadian Geological Survey has recently completed an investigation of the areas of continental Canada that are still unexplored. He did not include the Canadian islands because many of them are not yet sufficiently known to give a correct idea of their size. His results were published in the *Geographical Journal* in 1916. His map of the unknown area, however, was not printed with this article, but the *Geographical Review* for March, 1918 (p. 233), publishes both Camsell's map and also a map by George M. Dawson, showing the unexplored areas of continental Canada according to his studies in 1890.

In determining the unknown areas, Camsell assumes a strip 15 miles wide on each side of an explored route to be known, while Dawson assumed that the known strip on each side of the traveled route was 25 miles wide. Adjusting these differences so as to compare the two determinations of the unexplored areas, we find that Dawson's determination in 1890 was 950,000 sq. miles of unexplored area in continental Canada, and Camsell's determination in 1916 was 900,000 sq. miles. Camsell says that the present unexplored areas belong to three types of country. Two-thirds of the whole is in the Laurentian Plateau, the vast area of ancient rocks extending around Hudson Bay to the great lakes of Canada—Lakes Winnipeg, Athabaska, Great Slave and Great Bear. Its rocky surface and, in part, its climatic conditions unfit it for agriculture. Its main asset is minerals. The great central plain of the continent represents the second type of country, which in Canada narrows from a width of 1,000 miles in the latitude of Winnipeg to 200 miles across the middle Mackenzie.

Some of this area seems to be suited to agriculture, especially the block lying north of the Peace River and west of Great Slave Lake. The third type is that of the Cordillera, the chief value of which probably lies in its mineral resources.

Explorations in the Sahara.—Commandant Jean Tilho has completed the explorations in the south-central Sahara which have engaged him for six years (1912-17). The *Geographical Journal* for April, 1918, gives a summary account of his notable work taken from French sources. He has added to the map, to the northeast of Lake Chad, a large area most of which was practically unknown in any detail before his survey was made. Tilho has proved that Lake Chad is a closed basin. It has no outlet on its southeastern shore, as he and others had formerly conjectured. This evidence is the most important recent addition to our knowledge of African hydrology.

Tilho's investigations in Tibesti, which is intersected by lat. 20° N. and lies between long. 15°-20° E., were among the explorer's latest and most fruitful results. The region was formerly mapped as a single ridge extending northwest to southeast. Tilho found Tibesti covered with five or six mountain ranges radiating from the central chain to the southwest and northeast, the average width of this mountain system being about 250 miles in the northern two-thirds and narrower in the south. The extinct volcano Emi-kussi, pivoted on the eastern edge of Tibesti towards the south of that country, is over 11,000 ft. high, with a very large crater, 130 ft. deep and five to 7½ miles wide, the larger of the two vents measuring nearly two miles in width.

Tilho began the work of pacifying and organizing the regions of Borku and Ennedi, a mountainous area to the south and southwest of Tibesti. Borku, where sandstone rocks are half buried in the sand, has some 12,000 inhabitants, tending their goats and living on dates, millet and milk. Erdi, in the southwestern part of the Libyan Desert, is inhabited by predatory tribes who go far to prey on the caravan routes.

Tilho favors the building of a railroad through this region from Dakar, the chief port of Senegal, on the Atlantic, to Port Sudan on the Red Sea. The line would utilize long links of railroad already constructed, and Tilho says that, built outside of the tsetse-fly zone, it would connect with Europe a vast area adapted for cattle, cotton and other farm products raised by the natives.

Economic future of North Africa.—Capt. Philippe Millet, colonial editor of *Le Temps*, Paris, has published a long paper (*Jour. Roy. Soc. Arts*, June 8, 1917) in which he describes the present situation in Algeria, Tunis and Morocco. In resources they are among the richest countries in the world. Before the war their total trade amounted to over $360,000,000 a year. Their present wealth is still small compared with what it will become. The area of farm lands equals that of Italy and Spain together, and not over a fourth of it is yet under cultivation. The mineral wealth seems equally important, not only in Algeria, where the great iron deposits are still untouched, but probably in Morocco also. There are 50,000 French citizens in Algeria, 50,000 in Tunis and 40,000 in Morocco. It is fortunate that of the whole native population of Algeria (over 10,000,000) about nine-tenths are pure Berbers; in other words, they are of the ancient white stock. Thousands of Berbers go to France to work in factories. Over 270,000 of them were recently soldiers fighting in Europe under the French colors.

Agricultural Conditions in the Philippines.—H. J. Waters, president of the Kansas State Agricultural College, visited the Philippines in 1914, at the request of the Insular Government, to study the agricultural conditions and prospects of the islands. He found the country very backward, but its possibilities of development are great. He says in a paper published in the *Geographical Review* for April, 1918, that less than one-half of the agriculture lands are under cultivation; that with only 8,750,000 inhabitants, the country imports more foodstuffs *per capita* than Japan with over 50,000,000 people; that if the sugar planters grew as much sugar per acre as in Java, the Philippines with no increase in acreage would be the world's leading cane-sugar producing country; that if the Filipinos, who now import a fourth of the rice they consume, raised as much per acre as Japan or the United States, theirs would be the third largest rice-producing country; and if their acre yield of corn equaled that of Japan or the United States, the islands would have grain enough to support a larger pork and poultry industry than either Canada or Australia. When all the land is utilized to the limit of its producing power and the fisheries, manufactures and commerce of the Philippines are developed, enough food and wealth will be produced to support 40,000,000 people.

Projected Railroad between India and Ceylon.—Just before the war began, the prospects for complete railroad connection between India and the rich island of Ceylon were considerably improved by the building of a railroad viaduct across the Pambam Channel, off the coast of India, to the Island of Rameswaram, along which a railroad had been extended, also by a railroad across the Island of Manar, near the northwest shore of Ceylon. This left only Adam's Bridge, a chain of sand banks between Rameswaram and Manar, to be crossed by steam ferries. According to the *Geographical Journal* for November, 1917, Mr. Waring, an engineer of the Ceylon railroads, advocates a complete railroad across Adam's Bridge, to be carried on a series of embankments, alternating with bridges across the deeper channels; other engineers are of the opinion that a continuous embankment can be maintained across Adam's Bridge. The probability is that after the war the enterprise of establishing complete railroad connection between India and its great island, some 70 miles out to sea, will be attempted.

Steam Navigation on the Upper Yangtse River.—The great Yangtse River of China is navigable by large vessels up to Ichang, 1,000 miles from its mouth. Above this city formidable stretches of rapids seemed to make it impossible for steamboats to serve the transportation interests of the rich, fruitful and prosperous province of Sechuen. According to the *Geographical Journal* for December, 1917, the problem of steam navigation has at last been fairly well solved. A regular service has been established, the steamers plying during two-thirds of the year and making their terminus Sui-fu, considerably above Chungking, the capital of Sechuen. The voyage is made without interruption from mid-April to the end of October and sometimes up to the end of December. The journey above Ichang is made in six days up-stream and in two days downstream. A railroad is now under construction around the rapids, but there is no telling when it will be completed. Experts believe that in the freight trade the steamers will always compete successfully with the railroad.

Exploration in Central Australia.—Australia is trying to learn the possibilities of developing the vast, unoccupied areas of the country. The northern part of the Northern Territory has a very heavy rainfall, but the southern third of this region has only five to ten inches of rainfall a year. Through this southern region T. E. Day in 1915 and 1916 made expeditions with camels, covering 7,000 miles, largely through unmapped districts (*Bull. North, Terr.*, No. 20, 1916). He has derived from this expedition rather sanguine views as to the possibilities of development, particularly in the Macdonnell Ranges, which include the best country in the whole region examined and are especially adapted for horse raising. The whole region lacks communications and its isolation is the greatest impediment to development. Mr. Day therefore recommends the extension of the railroad from Oodnadatta to the Macdonnell Mountains.

XXIII. CHEMISTRY AND PHYSICS

CHEMISTRY

INORGANIC AND PHYSICAL CHEMISTRY

Arthur Wesley Browne

Hydrogen Peroxide and Ozone.—The behavior of hydrogen peroxide as a reducing agent toward various substances has been investigated by M. Kleinstück. Silver chloride suspended in a solution of potassium hydroxide, phosgene, and phenyl carbonate were all found to react with hydrogen peroxide. From the fact that formaldehyde seems to be obtained as a reduction product of potassium bicarbonate under suitable conditions, it is thought by the investigator that the assimilation of carbon dioxide by plants may be interpreted in accordance with the equation: $H_2CO_3 + H_2O_2 = CH_2O + H_2O + 3O$. The action of hydrogen peroxide upon ammonium hydroxide and iodine is said by T. C. N. Broeksmit to afford a convenient method for the prepartion of pure ammonium iodide. The velocity of the reaction between hydrogen peroxide and ozone in hundredth-normal sulphuric acid has been studied by V. Rothmund and A. Burgstaller. It was found by F. Fischer and H. Tropsch that ozone will dissolve in such liquids as acetic acid, acetic anhydride, ethyl acetate, chloroform, and carbon tetrachloride, at ordinary temperature, with formation of blue solutions. A. Fowler and R. G. Strutt have found, in photographs of the ultraviolet spectra of Sirius and of the sun, bands identical with those of ozone. They suggest the use of spectro-photography in the investigation of atmospheric ozone.

Nitrogen.—A. C. Vournasos has prepared beryllium nitride, Be_3N_2, by a number of different methods. This substance may be obtained by heating dry, powdered beryllium with dry, powdered mercuric cyanide or silver cyanide, or in an atmosphere of cyanogen at 800° C.; by heating beryllium carbide, Be_4C_3, in nitrous oxide or with ammonium nitrate in a crucible. P. Bruère and E. Chauvenet have reached the conclusion that zirconium probably forms only one nitride, Zr_3N_4, and that the alleged compounds Zr_2N_3 and Zr_3N_8 do not actually exist. E. Chauvenet and L. Nicolle have studied the basic zirconyl nitrates, and have reported the nonexistence of a neutral nitrate. "Disodium nitrite," a new compound of the formula Na_2NO_2, has been obtained by E. B. Maxted during electrolysis of a solution of sodium nitrite in liquid ammonia, or by interaction of sodium and sodium nitrite in this solvent. The oxidation of ammonia gas, and of sulphur dioxide, in the presence of platinum and of rhodium has been studied by P. Wenger and C. Urfer. The addition products formed by saturating an ethereal solution of mercuric chloride with ammonia have been investigated by Muriel C. C. Holmes. N. S. Osborne and N. S. Van Dusen have determined the specific heat of liquid ammonia between —45° C. and + 45° C., and the latent heat of vaporization of ammonia between —42° C. and + 52° C. The vapor pressure of liquid ammonia has been measured between 0° C. and the critical temperature by F. G. Keyes and R. B. Brownlee. The normal boiling point was found to be —33.20° C. G. E. Gibson and W. L. Argo have studied the absorption spectra of the blue solutions of certain alkali and alkaline earth metals in liquid ammonia and in methylamine. E. B. Peck has investigated the reaction between antimony and solutions of sodium in liquid ammonia. The thermal decomposition of certain inorganic trinitrides, including the silver, mercurous, mercuric, barium, thallous, lead, cupric, and ammonium salts, has been studied by A. R. Hitch. By double decomposition of silver trinitride and tetramethylammonium iodide F. V. Friedlander has prepared tetramethylammonium trinitride, $N(CH_3)_4N_3$, a compound that is empirically isomeric with tetramethyltetrazone, $(CH_3)_2N.N:N.N(CH_3)_2$. A discussion of the nitrogen problem in relation to the war has been published by A. A. Noyes.

Non-aqueous Solutions.—The solubility and dissociation of numerous electrolytes in ethylurethan have been determined by M. Stuckgold. The solubility of the potassium, rubidium, ammonium, tetramethyl- and tetraethylammonium iodides, the sodium, potassium, rubidium, and tetramethylammonium bromides, and the sodium, potassium, and ammonium chlorides has been measured, as well as the conductivity of solutions of the potassium, ammonium, and tetraethylammonium iodides, tetramethylammonium bromide, and the cobalt and zinc nitrates. The cryoscopic constant was determined, and measurements of the vapor pressure and the viscosity between 50° C. and 100° C. were also made. Continuing their earlier work on reactions in carbon tetrachloride, H. S. Fry and J. L. Donnelly (*A. Y. B.*, 1916, p. 615) have made a quantitative study of the reactions between chromyl chloride and various halides of phosphorus, including compounds of the formulas PI_3, PCI_5, PBr_5 and P_2I_4, in this medium. The use of benzene has been suggested by L. M. Dennis for the separation of benzene monosulphonic acid from sulphuric acid in the manufacture of synthetic phenol. He has also applied this principle to the separation of other sulphonic acids from sulphuric acid, and from one another, using benzene, toluene, and other nonaqueous solvents.

Chemical Warfare.—In a lecture delivered before the Washington Academy of Sciences (*Jour. Wash. Acad. Sci.*, viii, 45; also *Jour. Ind. and Eng. Chem.*, x, 297), S. J. M. Auld has given a general account of the methods of gas warfare employed by the Germans and the means of protection developed by the Allies. In an address upon chemical warfare research W. D. Bancroft (*Jour. Ind. and Eng. Chem.*, x, 785) has discussed some of the methods employed by the Chemical Warfare Service, U. S. A., in the investigation of gases, and in the development and production of materials used in connection with gas warfare. (See also *Industrial Chemistry, infra.*)

Metals and Alloys.—The specific heats of metallic sodium, potassium, magnesium, and calcium, and of lead sulphide, at low temperatures have been determined by E. D. Eastman and W. H. Rodebush. The use of eutectic alloys for temperature standardization and for temperature measurement has been suggested by C. P. Steinmetz, who submits a table of twelve alloys, with melting points ranging from 69.5° C. to 194.0° C., that are suitable for use in measuring temperatures. The chemical behavior of various compounds of gold at high temperatures and pressures has been studied by H. H. Morris.

Gallium.—L. M. Dennis and J. A. Bridgman have studied the spark spectra and the arc spectra of gallium, indium, and zinc, and have ascertained the delicacy of the spectroscopic detection of gallium and indium, either alone or in the presence of each other. They have also accomplished the purification of gallium by fractional electrolysis, and the preparation of pure gallium chloride by distillation. Two new salts have been described: gallium selenate, $Ga_2(SeO_4)_3.16H_2O$, and caesium gallium selenate alum, $CsGa(SeO_4)_2.12H_2O$.

Radiochemistry.—It is pointed out by C. H. Viol and G. D. Kammer that the most important uses of radium in warfare are in therapy and in luminous paints, particularly for the dials of airplane instruments. The luminosity depends upon the quality of the zinc sulphide used and upon the amount of radium used. The best results are said to be obtained from crystalline hexagonal zinc sulphide containing 0.215 mg. of radium in one gram of the mixture. W. D. Harkins and L. Aronberg have found an appreciable difference, amounting to 0.0043 A units, between the wave length of the line λ 4058 in the spectrum of pure lead, and the corresponding line in the spectrum of radium G. This is said to be the first observed difference between the spectra of isotopes. On the other hand, M. Siegbahn and W. Stenström have been unable to detect any difference between the X-ray spectra of lead and radium G. The sample of the latter substance used in this investigation was the same as that employed by Hönigschmid in his determination of the atomic weight of radium G. T. W. Richards and W. C. Schumb have made careful measurements of the refractive indices and the molal solubilities of two samples of ordinary lead nitrate and uranio-lead nitrate. No differences between the two samples within the limit of error of measurement were found as regards either property. It is stated by the authors that "the exceedingly small differences in spectra found by Harkins and Aronberg may perhaps be referred to differences in mass". The difference between the two kinds of lead is discussed by F. W. Clarke on the ground that isotopic lead is always the product of disintegrating elements, and is thus of variable atomic weight, whereas normal lead is the product of an orderly evolution of the chemical elements and is constant in composition and atomic weight. The evolution of the elements is considered to be in accord with astronomical evidence, as the simplest elements occur first in the new stars. On this basis, lead is to be regarded as the parent rather than the child of uranium and thorium. Evolution is slow, whereas the reverse process of radioactive disintegration is relatively rapid. It has been shown by J. Q. Stewart that when the ratio of the atomic number, N, to the atomic weight, W, is plotted against the square root of the atomic weight, a relation is obtained that is approximately linear for all the elements. This may be expressed by the equation $N/W = 0.520\text{-}0.0088\sqrt{W}$, which may be accounted for on the assumption that the atomic nucleus has a surface shell of positive electrons and a volume distribution of negative electrons.

Selenium.—The action of selenic acid upon osmium has been investigated by K. Hradecky, who finds that in the cold the acid is without appreciable action upon osmium. At a temperature of about 120° C., however, the metal is dissolved, with formation of a colorless solution, which contains selenious acid and osmium tetroxide, but no selenate. In continuation of his previous work T. Gassmann (*A. Y. B.*, 1917, p. 601, where the name is incorrectly spelled "Grossmann") has determined the amount of selenium in bones, teeth, and urine. Both healthy and diseased teeth were found to contain about 0.056 per cent. of this element, and urine showed from 0.0009 per cent. to 0.0011 per cent. Most vegetables, and in particular spinach, were found to contain a trace of selenium.

Halogen Compounds.—T. W. Richards and V. Ingve have measured the transition temperature of $SrCl_2.6H_2O$ into $SrCl_2.2H_2O$, which is 61.341° on the international hydrogen scale, and that of $SrBr_2.6H_2O$ into the next lower hydrate, probably $SrBr_2.2H_2O$, which is approximately 88.62°. It is suggested that these temperatures be employed as fixed points in thermometry. In the fifteenth article of his series on the nature of subsidiary valences, F. Ephraim has reported the results of his investigation of the thermal dissociation of numerous alkali polyhalides, and his determination of the temperatures at which the liberated halogen develops a pressure of one atmosphere. Polyhalides with the following formulas were studied: KI_3, KBr_3, KI_2Br, $KIBr_2$, $KICl_2$, $KClBr_2$, $KClI_2$. Determinations of the vapor pressure of the following compounds were made at different temperatures: CsI_3, $CsBrI_2$, $CsBr_2I$, $CsCl_2I$, $CsBr_3$, $CsClBr_2$, $CsCl_2Br.RbI$, $RbBr_2I$, $RbBr_3$, $RbClBr_2$, $RbCl_2Br$, $RbCl_2I.KI_3$, KBr_2I, NH_4Br_2I, NH_4Br_3, NH_4Cl_2Br, $CuCl_2$, and $CrCl_3$. N. H. Furman has investigated the behavior of solutions of stannic fluoride. He accomplished the preparation of hydrogen fluoride and of stannic fluoride in an apparatus constructed chiefly of copper, and studied the hydrolysis of the salt at 25°. J. Milikan has identified numerous oxyhalides of the alkaline earth metals in the course of his investigation of several ternary systems. In the system water, calcium oxide, calcium chloride, the compounds $CaCl_2.3CaO.16H_2O$, $CaCl_2.CaO.2H_2O$, and $CaCl_2.CaO.5$(or 4)H_2O were found; in the systems water, calcium oxide, calcium bromide, $CaBr_2.3CaO.16H_2O$ and $3CaBr_2.4CaO.16H_2O$; water, calcium oxide, calcium iodide, $CaI_2.3CaO.16H_2O$; water, strontium oxide, strontium chloride, $SrCl_2.SrO.9H_2O$; water, strontium oxide, strontium bromide, $SrBr_2.SrO.9H_2O$; water, strontium oxide, strontium iodide, $SrI_2.2SrO.9H_2O$; water, barium oxide, barium chloride, $BaCl_2.BaO.5H_2O$; water, barium oxide, barium bromide, $BaBr_2.BaO.5H_2O$; water, barium oxide, barium iodide, $BaI_2.BaO.9H_2O$.

Miscellaneous.—G. A. Rankin and H. E. Merwin have investigated the temperature-concentration relations of the various crystalline phases in equilibrium with liquid in the ternary system magnesium oxide, aluminium oxide, silicon dioxide. The crystalline substances found to be stable in contact with liquid are MgO (periclase), Al_2O_3 (corundum), SiO_2 (tridymite, cristobalite), $2MgO.SiO_2$ (forsterite), $MgO.SiO_2$ (clinoenstatite), $MgO.Al_2O_3$ (spinel), $Al_2O_3.SiO_2$ (sillimanite), and a ternary compound, $2MgO.2Al_2O_3.5SiO_2$ (cordierite). A. Stock and C. Somieski (*A. Y. B.*, 1916, p. 615; 1917, p. 599) have studied the bromination of monosilane. "Bromomonosilane," SiH_3Br, a colorless gas (m.p. —94°; b.p. +1.9°), and "dibromomonosilane", SiH_2Br_2, a colorless, mobile, highly refractive liquid (m.p. —70.1°; b.p. at 123 mm., 18°), have been described. Stock, Somieski, and Wintgen have prepared and purified "disiloxane", $(SiH_3)_2O$, by shaking bromomonosilane with water. This substance, which melts at —144° C. and boils at —15.2° C., is said to be the first volatile compound of silicon, hydrogen and oxygen. Disiloxane and chlorine react vigorously at 125° C., yielding hexachlorodisiloxane, $(SiCl_3)_2O$, as the first product. Dibromomonosiloxane was found to react with water, forming hydrogen bromide and a volatile compound, probably "oxomonosilane" ("protosiloxane"), SiH_2O, which has not yet been isolated, but which polymerizes very readily, yielding an amorphous, white solid. L. M. Dennis and A. B. Ray have subjected neutral nitrate solutions of the rare earths to fractional electrolysis, using a mercury cathode and a porous cup. It was found that the hydroxides of the earths were precipitated in the order of their basicities, and that their separation was the more complete the more vigorously the mercury cathode and the catholyte were stirred. The electrolysis of solutions containing thorium nitrate and nitrates of the rare earths when similarly carried out was found to effect a marked concentration of thorium in the early fractions. A single fractional electrolysis of a solution corresponding in composition to monazite resulted after three hours in the precipitation of nearly 26 per cent. of the thorium present, yielding hydroxides that contained 52 per cent. of ThO_2 as against five per cent. in the original mixture. T. W. Richards and V. Yngve have shown that the solubility of sodium sulphate may be conveniently used in determining temperatures between 15° C. and 25° C. S. L. Bigelow and C. S. Robinson have made a study of the manifestation of osmotic pressure with membranes of chemically inert materials. The membranes consisted of discs prepared by compressing finely divided silica, carbon (graphite and amorphous), copper, silver, and gold. Osmotic effects were observed with all of these membranes and sugar solutions. It was demonstrated that osmotic pressure can be produced through the agency of capillary forces alone, without the aid of solution processes or chemical reactions. A new kind of isomerism in cobalt compounds and compounds with asymmetric cobalt and carbon has been investigated by A. Werner. The nitrosopentammine cobalt salts have been studied by Werner and Karrer, and the constitution of inner metal-complex salts by Werner and Matissen. The preparation of certain new double carbonates of sodium and potassium with the heavy metals has been accomplished by M. P. Appleby and K. W. Lane. By treatment of a solution containing sodium carbonate and bicarbonate with cupric acetate, a double salt of the formula $Na_2Cu(CO_3)_2.3H_2O$ was obtained. With $Co(NO_3)_2$, the compound Na_2Co-

$(CO_3)_2.4H_2O$ was obtained, and by analogous procedure, $K_2Co(CO_3)_2.4H_2O$. The properties and equilibria of these salts were studied in detail. The carbides of aluminium and chromium have been investigated by O. Ruff. Aluminium carbide, Al_4C_3, was found to sublime at temperatures up to 2,200° C. without melting, though with some decomposition. At 2,200° C. the carbide is in equilibrium with graphite, molten aluminium saturated with graphite, and vapor. The corresponding equilibrium mixture of chromium carbide, chromium, and graphite boils at 2,270° C., and the vapor consists entirely of chromium. The melt is composed of Cr_3C_2 between 250° and 2,050°. Other chromium carbides, with the formulas Cr_4C, and Cr_5C_2, were shown to be formed. A. Rosenheim and G. Jander have made a study of telluric acid and its alkali salts in their behavior as colloids. It was found that these substances readily undergo polymerization, with formation of substances of semi-colloidal or colloidal character, according to the degree of polymerization. The sodium, lithium, and potassium salts behave in many ways like the free acid. These salts show no definite solubility in water. The statements made in the older literature concerning the alkali tellurates must be accepted with reserve.

ORGANIC CHEMISTRY

HARRY L. FISHER

Molecular Addition Compounds.—The formation of molecular addition compounds continues and will continue to be of great interest. The ordinary textbooks give little mention of this type of compound, because molecular compounds do not fit in very well with the strict ideas of atomic valence generally used. They may be compared with the hydrates, like $CuSO_4.5H_2O$, and $CaCl_2, 6H_2O$; and ammoniates, (or complexes) of silver, $2AgCl.3NH_3$, of copper, $Cu(NH_3)_4(OH)_2$; of platinum, $(NH_4Cl)_2.PtCl_4$; etc., the structures of which have been indicated by Werner's work. A final interpretation of the results in this field will no doubt have much to do with shaping our ideas of the "structure" of compounds in general. Refined methods of actually isolating the substances and also of showing their presence by using Menschutkin's freezing-point method have characterized the present work. In the freezing-point method the freezing points of definite mixtures are found and plotted and from the curve thus obtained it is possible to tell by the maxima what are the compositions of the molecular addition compounds formed. In this way it is possible to locate compound formation even though a particular compound could not be isolated on account of its instability under ordinary room temperature. One of the most striking results has been noticed in the isolation of many molecular addition products of organic acids and potassium hydroxide, as shown by Dehn and Merling (*Jour. Am. Chem. Soc.*, xxxix, 2646). These were prepared of course under anhydrous conditions in ether, otherwise the acid would have been neutralized with the formation of a salt, and were found in different combinations, such as one molecular equivalent of acid to one of the potassium hydroxide, 2:1, 1:2, and some others. Besides acids, other compounds containing carbonyl groups, esters, anhydrides, aldehydes, ketones, amides, imides, as well as alcohols and phenols, gave similar addition products. Schwarz and Dehn (*ibid.*, 2444) have also studied the addition compounds of benzene sulfonyl chloride and organic bases. Molecular combinations of ferric chloride and ether and of ferric chloride and dibenzyl sulphide have been reported by Forster, Cooper and Yarrow (*Jour. Chem. Soc.*, cxi, 809). By means of the freezing-point method Maas and Russell (*Jour, Am. Chem. Soc.*, xl, 1561) have demonstrated that at very low temperatures acetylene and also benzene do not form molecular compounds with hydrogen bromide, that ethyl benzene and hydrogen bromide do form two different products with the molecular ratios, 1:1 and 2:1, and that mesitylene and hydrogen bromide form one product, 1:1. They also verified the formation of a 1:1 compound of toluene and hydrogen bromide. These results are very interesting since at ordinary temperatures acetylene, a highly "un-saturated" compound, unites with hydrogen bromide, and benzene, the parent substance of the other hydrocarbons, also combines with many substances, of which picric acid is a good example.

Carbohydrates. — The manna that forms in large quantities on the twigs and needles of the Douglas fir tree during summer droughts has been found to consist largely of the rare trisaccharide melezitose (Hudson and Sherwood, *ibid.*, 1458). Melezitose is a non-reducing sugar, and on hydrolysis it yields first glucose and turanose, and the latter yields glucose and fructose.

The method of methylation of the hydroxyl group in the sugars, starches and celluloses with subsequent hydrolysis of the compound holds promise of indicating the probable "linking" of the simpler parts of the molecule in the greater complex, since the individual methylated sugar will then contain free hydroxyl groups where hydrolysis has taken place. Haworth and Leitch (*Jour. Chem. Soc.*, cxiii, 188) have recently shown by this method that in the molecule of milk sugar (lactose) the galactose part is linked up with the glucose part at the delta-carbon of the latter instead of the epsilon-carbon as formerly supposed.

Analytical.—There is no method known of separating quantitatively a mixture of malic acid (monohydroxy-succinic acid) and tartaric acid (dihydroxy-succinic acid) and determining them by chemical methods, since their properties are so much alike, but Willaman (*Jour. Am. Chem. Soc.*, xl, 693) has satisfactorily worked out a scheme which is based upon the increase in optical activity caused by uranyl acetate and by using a special non-linear plot made up from known mixtures. The use of the polarizing microscope for optical crystallographic measurements in the analysis of compounds, and especially organic compounds, has been urged by Chamot (*Jour. Ind. & Eng. Chem.*, x, 60) and Wright (*Jour. Am. Chem. Soc.*, xxxviii, 1647), and within the past year this method has been put to excellent practical use in several investigations—for example, in the identification of the cinchona alkaloids by Wherry and Yanovsky (*ibid.*, xl, 1063), and in the purine group by Venable (*ibid.*, 1099). A new organic precipitant for an inorganic radical has been added to the constantly growing list of such useful reagents. Hahn (*Ber. Deutsch. Chem. Ges.*, l, 705; *Chem. Abs.*, xi, 3195) has reported that 2,4-diamino-6-hydroxy-pyrimidine is an excellent precipitant for nitrites, giving a precipitate with as little as 0.05 mg. of $—NO_2$ per cubic centimetre, and a coloration with as little as 0.015 mg. It is stated that it cannot be used for the quantitative determination of nitrites, but is particularly useful for detecting nitrites in the presence of nitrates. The nitrates can afterward be detected or estimated in the usual manner after the precipitate of the nitrite has been removed.

Organo-metallic Derivatives. — Investigations in this field have no doubt been carried out partly because of the possibilities of the use of this type of compounds for gas warfare, etc. Many of them are poisonous and many are spontaneously inflammable with the production of a smoke formed by the oxidation products of the metal. The Grignard reagent (alkyl magnesium halide) has generally been used for the preparation of these compounds. Cadmium alkyls, CdR_2, have been prepared by Krause (*Ber. Deutsch, Chem. Ges.*, l, 1813; *Chem Abs.*, xii, 1884), and mixed tin tetra-alkyls, SnR_4, and tin tri-alkyl halides, SnR_3X, by Gruettner and Krause (*ibid.* (1), 1802; *ibid.* (2), 1883). From the tin tri-alkyl bromides, SnR_3Br, and sodium, Gruettner and Krause (*ibid.* (1), 1808; *ibid.* (2), 1883) prepared a new type of tin compounds, the hexa-alkyl-distannanes, $R_3Sn.SnR_3$.

L. W. Jones and L. Werner (*Jour. Am. Chem. Soc.*, xl, 1257) suggest that metal hydrides be called "hydrogen bases" since they react with acids to give salts and hydrogen, and similarly that metal organic compounds of the type of the zinc alkyls be termed "hydrocarbo bases" since they react with acids to give salts and a hydrocarbon. From the reactions of mercury dialkyls and diaryls in which it was found that acetic acid decomposed them into metallic mercury, a hydrocarbon, RH, and an alcohol, R.OH (or its acetate), they conclude that one radical may be considered as positive and the other as negative. Similarly tetra-alkyl lead compounds reacted as if three of the radicals were negative and one positive.

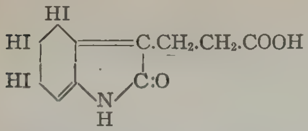
Organic sodium and lithium compounds have at last been obtained in a fairly pure state by the action of sodium and of lithium respectively on the corresponding mercury alkyls, HgR_2, in petroleum ether or benzene. The mercury is replaced by the sodium, giving metallic mercury, just as copper in copper sulphate is replaced by zinc, giving metallic copper. The sodium alkyls, NaR, are amorphous substances which decompose without melting on heating and inflame with violence in the air. They absorb carbon dioxide, under proper conditions, and form the sodium salt of an organic acid, for example, sodium benzyl, $C_6H_5CH_2Na$, and CO_2 form the sodium salt of phenyl acetic acid, $C_6H_5CH_2COONa$. The lithium alkyls are also spontaneously inflammable in the air and, as would be expected on account of the presence of the lithium, give a brilliant red flame. (Schlenk and Holtz, *Ber. Deutsch. Chem. Ges.*, l, 262).

A new book on *Organic Compounds of Arsenic and Antimony* has been published by Gilbert T. Morgan (London, Longmans, Green & Co.).

A New Nitrogen Type, NR_5.—Benzyl tetra-methyl ammonium $(C_6H_5CH_2)N(CH_3)_4$, has been prepared by Schlenk and Holtz (*ibid.*, 274; *Chem. Abs.*, xi, 2796) from sodium benzyl, $C_6H_5CH_2Na$ (see *supra*) in cold dry ether shaken with dry tetra-methyl ammonium chloride, $(CH_3)_4NCl$, in an atmosphere of nitrogen. It is either insoluble or decomposed by the ordinary solvents and is hydrolyzed by water to toluene and tetra-methyl ammonium hydroxide.

Assimilation of Carbon Dioxide.—Willstätter and Stoll (*Ber. Deutsch. Chem. Ges.*, l, 1777) have given added interest to Baeyer's well known hypothesis that the carbon dioxide absorbed by plants is reduced to formaldehyde as the first stage in the assimilation process. Other primary intermediate products have also been suggested, such as oxalic acid, formic acid, and glycolic acid. On examination, however, it will be found that of all the possible primary products so far considered, formaldehyde is the only one in the formation of which the volume of CO_2 absorbed would be equal to the volume of O_2 liberated. In other words, the "assimilation quotient," CO_2/O_2, is one in the case of formaldehyde, 1.33 for glycolic acid, two for formic acid, and four for oxalic acid. If it could be arranged, therefore, to determine this quotient in a trustworthy manner, eliminating respiratory effects, etc., an answer could be given to the much debated question. By a method similar to that used in connection with the assimilatory activity of leaves with different chlorophyll content (*ibid.*, xlviii, 1540), the quotient can be determined with a high degree of accuracy, the experimental error only influencing the second place of decimals, and it is found that the quotient is unity whether the temperature is 10° or 35°, whether the atmosphere is rich in CO_2 or even deprived of oxygen altogether, or whether ordinary foliage or succulent leaves like cactus are examined. With colloidal chlorophyll and CO_2 the same authors (*ibid.*, l, 1791) have concluded that the function of carbon assimilation is a chemical one, since chlorophyll reacts chemically with CO_2. Their findings have been published in book form, with the title *Untersuchungen über die Assimilation der Kohlensäure*" (Julius Springer).

Thyroid Constituent.—More rapid progress in physiology and medicine becomes possible as our chemical knowledge of the individual substances of the body is increased. A very important advance in this direction has been reported by E. C. Kendall (*Jour. Am. Med. Assoc.*, lxxi, 871), who has elucidated the structure of the active constituent of the thyroid gland. More than two tons of thyroid glands were used during the course of the investigation and about 20 grams of the active constituent isolated in a pure crystalline form. The substance contains the indole nucleus and is therefore related chemically to such important compounds as tryptophan, one of the decomposition products of proteins, indigo, skatole, isatin, etc. It has been named "thyro-oxyindole" and its structure is indicated by the following formula:



Lecithin. — Ordinary lecithin, the phosphorus- and nitrogen- containing fatty substance of egg yolk, seeds, brain tissue, etc., does not show the proper analytical figures for the structure usually assigned to it from its decomposition products. Part of the discrepancy has been shown to be due to the fact that 10 to 20 per cent. of the nitrogen is in the form of what is called amino nitrogen, or NH_2. This comes from the cephalin, which is found mixed with the lecithin, the nitrogen decomposition product of which is amino-ethyl alcohol, $HO.CH_2.CH_2.NH_2$, whereas the nitrogen of lecithin is in the form of choline, $HO.CH_2.CH_2.N(CH_3)_3.OH$. Levene and West (*Jour. Biol. Chem.*, xxxiii, 111, and xxxiv, 175) have cleared up the points in question by working with the hydrogenated substances and by purifying crude lecithin by means of the double salt with cadmium chloride, thus preparing pure lecithin which was found on analysis to agree with the formula usually assigned to it. The presence of cephalin and also of hydrocephalin in the hydrogenated mixture, since the NH_2 group is not affected by the hydrogenation, can be determined quantitatively by the Van Slyke method for estimating free amino groups with nitrous acid and measuring the N_2 gas set free. Barbieri (*Gazz. Chim. Ital.*, xlvii, I, 1) has claimed that lecithin does not exist as a chemical individual, and West (*Science*, xlvii, 389) cites the above work as seeming to prove the individuality of lecithin.

Spruce Turpentine.—The chief constituent of the so-called "spruce turpentine," the material which is formed as a by-product in the sulphite process for preparing paper pulp from spruce wood, is cymene, p-isopropyl-toluene, and is therefore available in large quantities. By a reversal of the Friedel-Crafts' reaction, R. H. McKee (U. S. Pat. 1,244,444) has shown how it can be converted by means of dry $AlCl_3$ and dry HCl into the much needed toluene for the preparation of trinitrotoluene and many other compounds. Propane is found among the products of the reaction. The same investigator (U. S. Pat. 1,265,800) has also shown that cymene can be converted into carvacrol by the usual type reactions for preparing a phenol from an aromatic hydrocarbon, that is, by sulphonating and then fusing with alkali. Carvacrol is o-hydroxy-cymene, an isomer of thymol, m-hydroxy-cymene, and bids fair to rival it as a germicidal material, especially in the treatment of hookworm disease.

BIOLOGICAL AND FOOD CHEMISTRY

C. L. Alsberg

Food Accessories. — Many studies have been made to determine the distribution of the fat-soluble and the water-soluble food accessories, also known as vitamines (*A. Y. B.*, 1916, p. 619), in the various common foodstuffs, and also to determine the chemical behavior of these substances for the purpose of separating them in a state of purity. Material progress has been made in both directions, and we may look forward to learning much about the chemical structure, now quite unknown, of these important food substances. The deficiency diseases (*A. Y. B.*, 1915, p. 618) have also been actively investigated. McCollum believes that polyneuritis, or beri-beri, is the only true deficiency disease except xerophthalmia, a disease of laboratory animals which is perhaps due to a deficiency of fat in the diet, and which resembles certain pathological conditions recently reported as occurring in infants. McCollum believes furthermore that the disease pellagra is due to general deficiencies of the diet, perhaps in protein and salts, rather than to deficiencies in food accessories. In dogs Chittenden and Underhill have produced a pellagra-like condition by a meatless diet. It now seems likely (Cohen and Mendel, Osborne) that the development of scurvy has no immediate connection with the absence of the water- or fat-soluble food accessories from the diet. Milk has been shown to contain only small quantities of the water-soluble food accessories (Osborne and Mendel) and of anti-scorbutic material (see also XVI, *Dairying*). The anti-scorbutic factor seems to be present in large quantities in fruits and vegetables. In the drying of fruits and vegetables, which has been extensively practiced during the year as a war conservation measure, the anti-scorbutic factors may be injured, and certain commercially dried vegetables, such as prunes, have little anti-scorbutic value (Hess). It seems likely that under carefully controlled conditions vegetables may be dried without losing much of their anti-scorbutic properties (Givens and Cohen).

Nutrition. — Hart and Humphrey have shown that the efficiency of food protein in milk production is very similar to its efficiency in producing growth. That is to say proteins that lack some of the necessary amino acids are not very efficient for milk production. The work to determine the nutritive value of individual pure proteins has been extended to the determination of the value of the mixed proteins in different articles of food (*A. Y. B.*, 1916, p. 620). Sherman and Winters have shown that corn is as good for maintenance as wheat. The nitrogen in potatoes is no better for growth than that in cereals though it is better for maintenance (McCollum, Simons and Parsons). A diet of whole seeds is not adequate, in part because such seeds do not contain the proper mixtures of salts necessary for growth. Moreover, some of the salts of vegetables, particularly calcium, are poorly utilized. The best source of calcium is milk. It would, therefore, seem that one of the arguments advanced for the production of whole-wheat flours and similar products, namely, that they contain a greater supply of salts than patent flours, is not entirely sound. It would seem that if any single necessary factor such as a necessary amino acid, a necessary food-accessory substance, or the necessary salts be absent from the diet, growth or even maintenance may be impossible though the diet be adequate in all other respects. Riddle has endeavored to establish a relation between the level of metabolism and sex determination in pigeons. (See also XXV, *Public Health.*)

Intermediary Metabolism; Blood Analysis.—It has been recognized for some years that a study of the blood will furnish the key to an understanding of many obscure pathological conditions in man. With that end in view much effort has been expended upon the development of methods of blood analysis so delicate that small quantities of blood, such as can safely be obtained from patients, would suffice, and so simple in technique that the hospital physician can employ them (Folin). Much success has attended these efforts, and among others we now have available methods for the determination in the blood of ammonia, urea, uric acid, creatin, sugar, carbon dioxide, hydrogen-ion concentration, fat, lipoids, cholesterol. The application of methods such as these has given us much new information on the intermediary metabolism in gout and the so-called uric-acid diathesis, in nephritis, in acidosis, and other serious disturbances. Much information has also been obtained on the metabolism of creatin and on the relation of acids and bases in the organism.

Proteins.—Levene and Lopez Suarez have cleared up the relations of the mucins and the mucoids. The former consist of protein and chondroitin-sulphuric acid, the latter of protein and mucoitin-sulphuric acid. The relation of these two acids has been made clear. Levene has furthermore revised the formula previously suggested by him for nucleic acids. Johns and Finks have isolated and studied the constitution of stizolobin, the principal protein of the velvet bean. The velvet bean has now assumed considerable importance in this country as a feeding stuff. Johns and Jones have investigated the constitution of the protein of the peanut. In milk Osborne and Wakeman have found a protein containing phosphorus, as well as a small quantity of a protein soluble in alcohol and somewhat resembling gliadin. Voegtlin and Sherwin have found a small quantity of the purin bases adenin and guanin in milk.

Food Supplies. — The U. S. Food Administration has effected many changes in the production and distribution of foodstuffs (see I, *War Organization*). All mills were required to extract at least 76 per cent. of flour from the wheat milled, and there was but one grade of flour on the market. This regulation caused many millers, particularly those operating small mills, to develop greater skill and efficiency in obtaining maximum yields of flour, and this will remain a permanent gain in the future; it is believed by many millers that the industry will never return to the old system of flour grades and short extraction. To stretch the supply of wheat further it was required that all bread contain at least 25 per cent. of flour substitutes. This resulted in an enormous expansion in the production of corn products—meal, flour, starch, glucose, and by-product feeds. The practice of corn milling has been correspondingly improved, and it is to be hoped that in the future more corn will be consumed as human food than formerly. By commercial bakers, especially for crackers, corn starch was largely used as a flour substitute because its whiteness improved the color of the flour; moreover, starch, not having any appreciable acid-combining power, does not materially affect the acidity of the dough, and hence requires less skill in manipulation than is the case with other flour substitutes. Corn flour, oat products and rice flour were also found satisfactory; barley flour was less so, for reasons which are not clear. It may be that the milling of barley requires special methods which have not yet been introduced.

Fortunately very little rope disease of bread developed in this country, whereas in Europe it was a great source of trouble. This form of spoilage of bread is due to the growth of a special bacterium in the loaf. Perhaps its absence was due to the extensive use in this country of corn products as flour substitutes. Corn carries a very great number of lactic acid-producing bacteria; these, developing in the dough side by side with the yeast, would tend to increase the dough's acidity, thus counteracting the acid-binding power of the flour substitute. It is well known that lack of acidity favors the development of ropiness in bread. Henderson and Cohn have determined the exact hydrogen-ion concentration that inhibits the growth of the bacillus that produces rope, and they have developed a simple method to determine this point in bread by the use of an indicator.

Further to conserve the food supply the use of edible materials for the distillation of potable liquors was prohibited and the brewers were limited to a supply of raw materials equivalent to but 70 per cent. of their pre-war requirements. Moreover, the alcohol content of beers was limited to 2.75 per cent. Later the manufacture of beer and of near-beers was prohibited altogether. (See also XVI, *Agriculture.*)

The production of malt syrup, for which purpose some breweries were converted, was undertaken to meet the shortage of sugar. Excellent products have been made which are proving satisfactory to bottlers of soft drinks, bakers, and confectioners. It is likely that this will remain a permanent industry, and thus an outlet will be created for barley, the market for which has been narrowed by the prohibition of brewing. Whether malt syrup will be able to compete with glucose or corn syrup remains to be seen. The production of the latter was stimulated enormously by the shortage of sugar, and refiner's syrup, hitherto largely exported, has been, and will probably continue to be, widely used in this country.

The world shortage of fat has had a profound effect upon the fat and oil industry. There has been a great increase in the manufacture and consumption in this country of oleomargarines and particularly in the production of so-called vegetable margarines, which consist, as a rule, of mixtures of coconut oil with peanut oil or cottonseed oil, churned with milk or skimmed milk. At the same time there has been a very great increase in the production of peanut oil and of coconut oil. Halliburton and Drummond have found that the margarines containing beef fat and oleo oil contain fat-soluble food accessories, while the so-called nut butters contain none.

This development of the oil industry has led to the importation of larger quantities of tropical oils and fats, especially of coconut and soy-bean oil. The soy-bean oil and the coconut oil are imported in part as such, in part as soy beans or as copra, the trade term for dried coconut meats. In consequence we have now an extensive soy-bean and copra-crushing industry which should remain a permanent asset to the country if we are able to compete successfully in normal times with the European countries for the raw material. The War Trade Board also influenced the oil situation by placing an embargo upon the importation of olive oil. In consequence the use of such oil as that of the peanut and of the cottonseed for table, for cooking and for fish-canning purposes increased enormously. Some 200,000 gals. of edible oil have been pressed from almond and peach kernels in California. It was used in the canning of sardines, an extensive industry which has sprung up in California within three years and which is adding two million cases of fish per annum to the country's food supply. It is probable that the country's food habits so far as oils and fats are concerned have been permanently changed in that in the future the food oils will be less discriminated against in favor of the solid fats and such oils as peanut oil will be substituted more largely for expensive imported olive oils.

Food and Drug Control.—Owing to the scarcity and high prices of raw materials, the outstanding feature of the year's work in the enforcement of the Federal Food and Drugs Act has been the recurrence of practices long since discarded. Examples are the adulteration of olive oil with cottonseed or corn oil and the substitution of glue for gelatin. The U. S. Department of Agriculture issued six food-inspection decisions: No. 171, macaroni, spaghetti, vermicelli, flour macaroni, flour spaghetti, and flour vermicelli; No. 172, condiments other than vinegar and salt; No. 173, canned vegetables, canned peas, and canned pea grades; No. 174, baking powders; No. 175, colors in foods; No. 176, evaporated apples.

In two cases the courts have handed down decisions of importance in interpretation of the law In the first of these (Notice of Judgment 6142), the U. S. Circuit Court of Appeals for the Seventh Circuit affirmed the judgment of conviction in the lower court against the Union Dairy Co. for a shipment of milk from Troy, Ill., to itself at St. Louis, Mo., the charge being that the milk was watered, and also filthy, putrid, and decomposed. The Union Dairy Co. contended that it was shipping the milk from a receiving station in Illinois to itself in Missouri, there to be treated, impurities removed, and the milk standardized; that while in transit it was not an article of food as defined by the Food and Drugs Act and did not become such an article of food until after treatment. The Court held that it would be an unjustifiable construction of the Act to make liability turn upon a difference in identity of consignor and consignee or the secret intent with which a shipper made the shipment.

In the other case (Notice of Judgment 6151) the U. S. Supreme Court reversed the judgment of the District Court sustaining a demurrer to an indictment alleging an article labeled in part "Compound Ess. Grape" to have been adulterated and misbranded. The article did not contain any product of the grape, and the Court held that "to call it 'compound essence of grape' certainly did not suggest a mere imitation, but on the contrary falsely indicated that it contained something derived from grapes."

AGRICULTURAL CHEMISTRY

ALBERT R. MERZ

Soils.—The great importance of the study of the soil solution has become generally recognized and has led to many efforts to secure fair representatives of the true solution in amounts large enough for extensive work. Much information on soil fertility has been obtained from the study of drainage waters, soil extracts, and synthetic solutions as well as from the solutions obtainable by means of the centrifuge, the artificial "root", and those methods which employ displacement of the soil solution by water or alcohol. There are, however, objections to all of these. Morgan (Mich. Agr. Expt Station Tech. Bull. 28), by development of the paraffin-oil displacement pressure method of obtaining the soil solution, has apparently opened up a promising field of study for the soil chemist, physicist and bacteriologist and the plant physiologist.

Bouyoucos and McCool (Mich. Agr. Expt. Station Tech. Bull. 31) have devised a means of measuring the concentration of the soil solution directly in the soil, based upon the determination of the lowering of the freezing point of the soil moisture by the salts dissolved in it. They found that the depression of the freezing point of soils can be easily measured down to a very low water content, but below this minimum, which corresponds very closely to the wilting coefficient of soils (*cf. A. Y. B.*, 1912, p. 643), solidification does not readily take place. The method is consequently proposed as a means of determining this coefficient, and the authors suggest that the concentration of the soil solution is a factor to be considered in the wilting of plants. In all soils except extreme types of sands the depression of the freezing point was found to increase in geometrical progression while the percentage of water descreased in arithmetical progression. An explanation of this is offered in the hypothesis that some of the water is loosely combined or physically absorbed in the colloids of the soil and, being removed from the liquid phase, is not available as a solvent. That successive freezings decreased the magnitude of the lowering of the freezing point at the low moisture content is attributed to the liberation of this inactive water by coagulation of the colloids. Hoagland at the University of California (*Jour. Agr. Research*, xii, 369), by use of this method, has observed that carbon dioxide markedly increases the water-soluble material in the soil solution whereas leaching decreases its concentration, and that the growth of a crop so decreased the concentration that the effect was still evident at the beginning of the following season. McCool and Wheeting have used the method (*ibid.*, xi, 531) for determining the movement of soluble salts through soils, and conclude that these move from regions of high to low concentration in moist soils at a rather rapid rate and do not remain long localized, as has been reported by previous investigators. The fact that the water expands upon freezing has been utilized by Bouyoucos (Mich. Agr. Expt. Station Tech. Bull. 36) for the classification and measurement of the different forms of water in the soil by means of a dilatometric method. All the water that freezes at or slightly below O° C. is considered free water, that which freezes from this temperature down to —78° is regarded as absorbed water, and that failing to freeze at the last temperature is called combined water. Free water was found to predominate in sands and fine sandy loams whereas combined water, followed by capillary absorbed water, predominates in clay loams, humus loams and clays.

The subject of soil acidity has received a very large share of attention during the year. Mention has been made in previous issues of the YEAR BOOK (1914, p. 624; 1915, p. 623; 1916, p. 625; 1917, p. 608) of the many conflicting ideas and theories held in regard to this phenomenon. According to Hoagland and Sharp (*Jour. Agr. Research*, xii, 139), the discordant results appearing in the literature are due to the attempt to use interchangeably the terms "lime requirement" and "soil acidity". The methods of determining the former are so varied and dependent upon arbitrarily selected conditions that their use has led to confusion, whereas the latter has a definite concise meaning —namely, that condition of the soil in which its aqueous solution contains hydrogen-ions in excess of hydroxyl-ions. This is called "true acidity" by Plummer (*ibid.*, 19), who by use of the Morgan apparatus (see *supra*) for extracting the film water from soils showed that its reaction is the same as that of the free water. According to Gillespie and Wise (*Jour. Am. Chem. Soc.*, xl, 796) such "truly acid" soils are not rare but very common and widely distributed in the United States. According to Gillespie and Hurst (*Soil Science*, vi, 219) the true acidity of certain soils is actually responsible for the freedom of potatoes from the common scab. Rice and Osugi (*ibid.*, v, 333) ascribe soil acidity to (1) a slight quantity of acid dissolved in the soil solution, (2) acid strongly adsorbed on the soil-particle surfaces, (3) insoluble silicic acid, and (4) selective adsorption.

The relation of soil acidity to crop growth has also received considerable study. According to Hartwell and Pember (*Jour. Am. Soc. Agron.*, x, 45; *Soil Science*, vi, 259), the injurious effects of aluminium salts in acid soils are attributable rather to the toxicity of the aluminium than to the free acid resulting from hydrolysis and the lime requirements of a soil may be due to the need of precipitating toxic metal as much as to neutralize soil acidity. Funchess (Ala. Agri. Expt. Station Bull. 201, p. 37) advances a similar view relative to the infertility of acid soils and includes manganese among the toxic metals the injurious effects of which are counteracted by liming. Truog (*Soil Science*, v, 169) grants that in certain unusual cases these and other toxic substances may be present in amounts sufficient to be very harmful to some plants, but holds that the main cause of the specific harmful influence of soil acidity is due to the plant's inability to secure calcium as the carbonate at a sufficiently rapid rate to neutralize and precipitate certain acids in the plants themselves, produced as the result of the vital reactions in their growth.

With reference to the question of unproductiveness of soils as influenced by organic compounds toxic to plants (*cf. A. Y. B.*, 1915, p. 624; 1917, p. 603), Skinner (*Jour. Franklin Inst.*, clxxxvi, 165, 289) has studied the effect of six aldehydes in nutrient culture solutions and found that each proved detrimental to plant growth. Two of these, salicylic aldehyde and vanillin, were found to occur in soils of low productivity quite frequently. Field studies showed that the added aldehydes were destroyed in soils having strong biological activities and good oxidation powers and that were fertile. Unfertile soils, due to the presence of harmful aldehydes, can be improved by good drainage and the use of lime and certain fertilizers. Robbins, investigating the causes of the destruction of harmful organic substances in soils (Ala. Agr. Expt. Station Bulls. 195 and 204), isolated specific bacteria which could utilize cumarin, vanillin and pyridine as food sources and caused their destruction by oxidative processes. The persistance of vanillin in certain soils is believed by him to be possibly due to poor oxygenation conditions inhibiting bacterial life.

According to the work of Breazeale (*Jour. Agr. Research*, x, 541) the alkali crusts that accumulate upon the soil in some irrigated regions are due in part to the action of sodium salts upon calcium carbonate with the formation of sodium carbonate ("black alkali"). This is often brought about by a calcareous hardpan. Since the presence of calcium sulphate has no effect in preventing the formation of sodium bicarbonate when sodium sulphate reacts with calcium carbonate, he concludes that a field application of gypsum will probably not overcome black alkali if the soil or irrigation water already contains soluble sulphates.

Fertilizers.—That the phosphorus of raw rock phosphate applied to the soil may be rendered available by the addition of sulphur has been shown by the work of Lipman and McLean (*Soil Science*, v, 243, 251) and of Brown and Gwinn (Iowa Agr. Expt. Station Research Bull. 43). The latter found that where both manure and sulphur were used with the rock phosphate, the increase in availability of the phosphorus was greater than that attained by use of manure or sulphur alone, and that a rather definite relationship exists between the sulphofying power of the soil and the production of available phosphorus. Brown and Warner (*Soil Science*, iv, 270) have similarly found that composting floats with manure and sulphur caused a remarkable increase in the production of available phosphorus, which became larger with long continued fermentation. McLean, on the other hand, concludes from his work that a compost of soil and sulphur and floats is the most economical combination for the production of available phosphoric acid, and that the presence of large amounts of organic materials such as peat, fresh horse manure and old composted manure brings about a decrease in efficiency.

Lipman and Blair (*ibid.*, v, 291), as the result of twenty years' work on the comparative availability of the nitrogen in nitrate of soda, ammonium sulphate, dried blood and farm manure on Penn loam soil well supplied with phosphoric acid, potash and lime, state that crop yields were better maintained with nitrate of soda at 320 lb. per acre than with equivalent amounts of ammonium sulphate or dried blood. Though cow manure at the rate of 16 tons per acre gave better results than nitrate of soda, the increased yields were not sufficient to justify the increase in cost of the nitrogen. They conclude that nitrate of soda when properly used alone may be depended upon to maintain crop yields over a long period, that larger crops per unit of nitrogen are obtained from it than from ammonium sulphate or organic materials, and that these crops in turn leave behind in the soil larger crop residues which, with calcium carbonate to aid in their decomposition, furnish a sufficient supply of organic matter to keep the soil in good condition.

According to Schreiner (*Proc. Potato Assoc. of America*, 4th annual meeting), the shortage of potash for potato crops has manifested itself in some very definite foliage reactions, recognized and designated as "potash hunger", which have brought about low yields in the sandy soils of the Atlantic coast states from Maine to Virginia. Likewise the potash deficiency in the sandy soils of the Coastal Plain has been marked in its effects on cotton, taking the form known to cotton growers as "rust".

Plant Chemistry.—Forbes (Ariz. Agri. Expt. Station Bull. 80), investigating the effects under irrigation of copper compounds upon crops, found that the root systems of individual plants contained relatively large amounts of copper which was largely in combination with the plant proteids especially at and near the growing points. The place and nature of the reaction accounts for the extreme toxicity of copper salts to plants. The aerial portions of the plants showed a comparatively small and probably not injurious accumulation of copper.

In a study of the chemistry of the cotton plant at the U. S. Bureau of Chemistry, Viehoever, Chernoff and Johns (*Jour. Agr. Research*, xiii, 345) have isolated an ethereal oil which has been found to be decidedly attractive to the boll weevil. They have thus apparently found the substance whose attractiveness causes such disastrous losses to the cotton industry. (See also XXIV, *Botany*.)

Dairying.—The cause of the deterioration in quality of butter during storage has been thought to be due to the action of the fat-splitting and protein-hydrolyzing enzymes in it. Thatcher and Dahlberg as a result of their study of the enzymes in milk and butter (*ibid.*, xi, 437) conclude that enzymes are present in butter in such small amounts and under such unfavorable conditions (due to the presence of salt and low temperature) for enzyme activity during cold storage that they cannot be considered as factors in the deterioration changes.

ELECTROCHEMISTRY

ALLISON BUTTS

General Development.—Further evidence was given in 1918 that development of a most useful and permanent kind in the field of electrochemistry has resulted from the impetus given by the war. Investigations of a theoretical or purely scientific nature were perhaps fewer than usual, but the design of new electrochemical processes and apparatus and the extended application of old ones were alike prolific. The use of electric power in the chemical and metallurgical industries is rapidly increasing and aggravates the problem of power supply. The Government has as yet taken no action looking to the further utilization of Niagara's power, and other important hydroelectric developments are still mainly in prospect only. (See also XX, *Electrical Engineering.*)

Fixation of Atmospheric Nitrogen.—Two Government nitrate plants are under construction near Sheffield, Ala., one to employ the synthetic process and the other the cyanamide process. Eventually they will obtain their power from hydroelectric development of the Tennessee River at Muscle Shoals, but on this nothing has been done and probably nothing will be done for several years (*Elec. World*, lxxi, 1358). In Plant No. 1, using the synthetic ammonia process, part of the ammonia will be oxidized to nitric acid and the final product will be ammonium nitrate. The output in terms of nitric acid will be 200,000 lb. a day. Plant No. 2 is being built by the Air Nitrates Corporation acting as agent of the Bureau of Ordnance. The process used will be identical with that employed in the present plants of the American Cyanamid Co. The limekilns will burn 350,000 tons of lime per year and the coke dryers will handle 100,000 tons. Carbide furnaces will fuse the lime and coke, after which the product will be cooled, ground and placed in ovens of one-ton capacity for treatment with nitrogen. The liquid-air plant for nitrogen production will have a greater capacity than that of all similar plants now existing in the United States and Canada. The cyanamide, which contains from 20 to 21 per cent. nitrogen, will be cooled, ground, placed in autoclaves and treated with steam, to produce ammonia. This gas when mixed with air is passed through a heated platinum screen, whence the nitrogen is oxidized by catalysis. The oxide gases are then cooled and absorbed. One-half of the ammonia produced in the autoclaves will be thus oxidized and combined with the rest of the ammonia for the production of ammonium nitrate. The Government in addition has under contemplation the erection of two other nitrate plants in Ohio, one at Elizabethtown and the other at Toledo. Both plants combined will have an output equal to Plant No. 2 at Muscle Shoals.

Electric Furnaces.—The most striking recent development in the electrochemical field has been that of the electric furnace. Not only in the steel industry, where it has proved so superior in the making of the alloy steels that are in such demand, as well as useful for steel castings and other melting operations and in the triplex process, but also in the manufacture of non-ferrous alloys and melting of non-ferrous metals, its use is rapidly extending. Its progress is both numerical, as evidenced by the number of new installations, and technical, as shown in the development of many new designs. The Ajax-Northrup furnace is designed to melt any kind of material, conducting or non-conducting, by induction in conjunction with the crucible, using oscillating current at high voltage. The oscillations are produced by discharges from a condenser and the energy conducted to a series of closed coils, mounted concentrically, and insulated from each other. Coils completely surround a cylindrical crucible in which the charge is melted. Most of the heat is generated in the material to be melted, which is thus at a higher temperature than the refractory material of the furnace in which it is contained. Furthermore, the melt may be made in a vacuum or in any kind of atmosphere, entirely out of contact with any outside influence. The furnace may be used with or without crucibles, needs no liquid charge for starting, requires but a small amount of refractory material and is adapted for intermittent or continuous operation. Consuming 16 kw.-hr., 45 lb. of brass scrap can be melted in 35 minutes. A temperature of 1,650° C. may be attained. New experimental furnaces in the non-ferrous field include the General Electric (smothered-arc), the Bennett, and the Conley (molded-resistor) (*Foundry*, XLVI, 110). In the last the charge is melted in an open graphite crucible, which closes the secondary circuit. The single-phase operation gives satisfactory heat control, a fast melt with good product, and a total metal loss of less than 0.2 per cent., melting 100 lb. of copper with 12 kw.-hr. The Thomas-Fitz-Gerald furnace is used in conjunction with condensers into which the fumes escape. It is good also for melting brass or bronze. A rocking electric brass furnace has been developed by the Bureau of Mines (*Jour. Ind. and Eng. Chem.*, x, 459) to melt successive heats of alloys differing widely in composition, for example, those free from zinc and those high in zinc. From 102 tons of metal melted in strict comparison with crucible furnaces it produced 1.8 per cent. more metal from the same charge.

W. E. Ruder (*Bull. Am. Inst. Min. Eng.*, No. 134, 585) describes high-temperature resistance furnaces with ductile molybdenum or tungsten resistors. The windings are protected from oxidation by hydrogen in a closed cast-iron casing. The maximum temperature is limited by the softening point of the refractory used (alundum). In one type, a vacuum furnace using a tungsten tube as resistor, 3,350° C. may be attained provided oxidation is effectively prevented.

The Booth-Hall furnace, adapted to heavy ferrous-alloy and steel-casting work, makes use of an auxiliary electrode to insure a positive start of the furnace and to give a balance load on the power circuit. In starting on a cold charge the auxiliary electrode is lowered until it rests on top of the charge, and the arc is then drawn between the charge and the main electrodes, the auxiliary acting as a return for the current. When enough metal has been melted to form a pool, the hearth becomes conductive and the auxiliary is withdrawn. In a cold furnace the auxiliary is in use 30 to 45 minutes, in a hot furnace less than 15 minutes. In the hearth two sets of grids are embedded, so related to the main electrodes that the currents cross in the bath, thus giving maximum circulation to the metal (*Trans. Am. Electrochem. Soc.*, xxxiii). The Vom Baur furnace embodies a new design of the polyphase, solid-bottom arc type. It has a two-phase, three-wire connection, with the three electrodes in a straight line, all contained in an oval-shaped hearth which has an equal heat gradient at the slag line. The center electrode carries 41 per cent. more heat into the furnace than either of the end ones, which facilitates melting a cold charge as piled naturally in the furnace with the apex of the pile at the center. Also the end electrodes can be tilted toward the apex and moved out gradually as melting proceeds, thus equalizing wear on the walls (*ibid.*, xxxiii).

Electrolytic Zinc. — The electrolytic process producing zinc of 99.9 per cent. purity has reached the stage of smooth-running operation, comparable with that of electrolytic copper or lead, when suitable ores are used. C. A. Hansen, who carried on the original experiments for the General Electric Co. that resulted in the commercial development of the process, has published a detailed account of some of the experiments (*Bull. Am. Inst. Min. Eng.*, No. 135, 615). It was found that when proper purification methods have been applied to a given solution, the behavior of the cell is quite independent of original sources from which the zinc sulphate has been derived; the realization of the necessity for thorough purification of zinc solutions has made electrolytic zinc commercially possible. No inorganic addition agent has as yet been found to improve the power characteristics of the zinc cell. Two major reactions occur in the cell: (1) deposition of zinc at the cathode at a rate which depends entirely upon the current density and according to Faraday's constant; (2) corrosion of the deposited zinc by the electrolyte, independent of the deposition rate, but depending entirely upon the chemical activity of the solution and upon the zinc surface exposed. The corrosion rate is mainly determined by the acid concentration of the electrolyte, and increases with the temperature of the bath. Of the impurities contained in the solutions as they leave the leaching tanks there are two groups: (1) the non-cumulative, Cu, Ad, As, Sb, Fe, Mn, Si, Al; and (2) the cumulative, Ni, Co, V, U. Copper and cadmium are quantitatively precipitated upon metallic zinc; arsenic and antimony come down on zinc, but not so completely, and apparently are not precipitated electrolytically with the zinc. Iron in the electrolyte is injurious, while manganese is harmless; cobalt and vanadium cause much annoyance by accumulating.

Manganese. — Ferromanganese was for the first time made in the electric furnace in the United States in important quantities in 1918; it is estimated that 10 per cent. of the total was so made. Work progressed during the year on the large installation at Great Falls, Mont., for this purpose and a considerable quantity of the alloy was turned out before the plant was shut down toward the end of the year. The closing down was due to the slackening in demand for manganese after the conclusion of the armistice. There were to be five electric furnaces, of 3,000 kw. at 85 volts each. They were to reduce each 50 tons of rhodocrosite ore per day, producing in all 90 tons per day of 80 per cent. ferromanganese. (See also XVII, *Iron and Steel.*)

In addition some silicomanganese is being made in electric furnaces. This alloy, containing about 20 per cent. silicon and low in carbon, is likely to be increasingly used as a deoxidizer in place of ferromanganese, as it can readily be made from the immense quantities of American manganese ores which are too high in silica for making ferro.

Electroplating.—At a conference of military authorities, some representative members of the plating industry, officials of the American Electroplaters' Society, and members of the Bureau of Standards staff, it was decided that zinc plating is the most efficient means of preventing corrosion of iron and steel. No specifications are necessary for materials not subject to severe corrosion conditions, but black finishes should be specified as "black nickel" and copper sulphide finishes eliminated. As occlusion of hydrogen from pickling and plating solutions containing free acids causes crystallization of high-carbon steel, the wet method of tumbling, together with the use of an abrasive with an alkaline soda solution is suggested. Added protection to zinc-plated steel is afforded by immersing the parts in a mixture of paraffin and paraffin oil at a temperature above 100° C.

O. P. Watts and C. T. Fleckenstein (*Trans. Am. Electrochem. Soc.*, xxxiii) showed by experiments on watch springs that brittleness after electroplating is most likely due to liberation of hydrogen. Heating the electrolyte lessens brittleness. F. C. Mathers (*ibid.*) experimented with copper-cyanide plating baths. He found that sodium-cyanide additions are needed and sodium carbonate and sulphate also proved valuable. Sodium hydroxide lowers both anode and cathode yields in baths of minimum sodium-cyanide content, but has little effect when sufficient of the latter is present. Sodium cyanide sufficient to replace that lost by decomposition and by neutralization by the extra copper gradually accumulating is all that is needed. The best bath contains CuCN, 4.5 per cent., NaCN, 4.3-4.7, and Na_2CO_3, 4.0 per cent., with slight increase in metal content, and is operated at 0.65 amp. per square decimeter. C. H. Proctor (*Met. Ind.*, xvi, 26) found that excellent results were obtained when the cheaper sodium salt was substituted for the ammonium and potassium salts in black nickel-plating solutions. Among the interesting exhibits at the Chemical Exposition in New York were a number of shapes of pure electrolytic nickel which had been deposited on moulds to a thickness of as much as one-eighth inch. These were made by a new process called the Madsen process (*Met. and Chem. Eng.*, xix, 640), which gives at low cost remarkably fine deposits of many times the thickness heretofore possible, with properties comparable with those of rolled nickel.

INDUSTRIAL CHEMISTRY AND CHEMICAL ENGINEERING

JAMES R. WITHROW

General Development. — War-time development in industrial chemistry is increasingly influenced by the necessity for curtailment of production in some lines and for expansion in others. Many necessary projects with Government backing are under way that would not succeed in normal times. Much intelligent effort has been made to utilize resources for war purposes, although inexperienced war officials have failed at times to avail themselves of obvious opportunities, as shown in the failure to grasp the platinum and other situations. The genius, skill and labor, however, that sent the *Kronprinzessin Cecelie* out of Boston Harbor, past her former master, chagrined and furious at the "Yankee trick" of accomplishing in four months what he said could not be done in two years, and the skill which added three knots to the speed of the *Vaterland* as a troopship by engineering attention to steam-feed details, have adequately met the problems of the war in industrial-chemical and chemical-engineering lines. Never before have we seen such speedy design, erection and placing in operation of chemical plants of prodigious size, for explosives, nitrogen fixation (see *Electrochemistry, supra*), and other products.

Chemical Warfare.—If the enemy had confined himself to so-called legitimate warfare, the war efforts of chemists would have been confined to such industries as munitions. The enemy chose, however, to break the Hague Convention and strike the cowardly blow with chlorine that was to take him to the Channel and did not. He raked the terrors of chemical phenomena in search for that which would give him the greatest advantages in his barbarous warfare. This fact made the chemists, those who alone know the agonies such tools can produce, to be anxious to a man to throw themselves with all their experience into the struggle for both defense and offense. It has taken some heroism to refrain from direct service in this new gas warfare and to use instead one's chemical experience in the necessary war industries themselves, not to speak of such essential though apparently inglorious work as the training of new bevies of chemists to strengthen the chemical fighting line in all its parts. The Government's chemical war activities as regards direct warfare were first organized in a thorough manner by the foresight of the Bureau of Mines. It was later coördinated into the branch of the Army under Major-Gen. Wm. L. Sibert known as the Chemical Warfare Service. In its many activities this Service has done much to atone for the unnecessary slowness and lack of foresight in the production end that was so discouraging at first, when this phase was left to purely research men of no manufacturing experience. All the Allies, however, appear to share the blame for failing to recognize that Germany's use of gas would be limited only by her ability to produce chemically. (See also *Inorganic Chemistry, supra.*)

Kelp Utilization.—One of the most satisfactory indications of American chemical capacity to rise to an emergency is illustrated by the development of the kelp industry in the last year. Kelp and seaweeds have frequently been employed in the past for the production of potash and iodine. Prior to the discovery of the German Stassfurt potash deposits, the kelps of Scotland were gathered and burned and the slag or ash used for soap and glass manufacture. Prior to the working up of the Chilian nitrate deposits for iodine, kelp liquor was the only source of this element; in fact, iodine was discovered by a French soap manufacturer who probably used the potash from kelp in his soap. The seacoast people of France, Norway and Scotland profitably gathered kelps for iodine, and the Japanese at the present time have a production of about 40 per cent. of that turned out by the Chilian deposits. In Japan also other products are produced from the seaweed, such as foodstuffs, agar, glues, etc. The material has been used as a valuable fertilizer in northern Europe, the British Isles, on the New England coast and in northwestern America.

Several attempts were made in this country to utilize the potash contained in the kelps when the potash supply was cut off from Germany (*A. Y. B.*, 1917, p. 616) but these projects were inadequately conceived and backed. When, however, some of the powder companies demanded acetone for the manufacture of cordite to be obtained without disturbing the sources from acetate of lime and molasses, one of them discovered in the literature that an Englishman many years ago had obtained a small amount of acetate and butyrate of lime from fermentation of seaweeds. Investigation disclosed the fact that the kelp of the Pacific Coast would give a similar result and that acetic acid could be obtained in this way in large quantities with potash as a profitable by-product. At once the mechanical side of the harvesting of kelp was investigated and perfected. The extensive kelp beds off the coast of southern California were surveyed and a plant for handling 1,000 tons of kelp per day for acetic acid for acetone was placed in operation within a year although the difficulties were great. The kelp is fermented in the largest group of settling tanks on the Pacific Coast, with other extensive equipment. Acetate of lime was finally found to be the most satisfactory for the production of acetone, as was well known to those familiar with this business, but sodium acetate accumulated in the meantime and became the basis for the extensive production of products, such as ethyl acetate, known as esters and of value as solvents in the production of airplane dope (see *infra*). Among the interesting derivatives produced are many products that will be of value if local markets can be developed. At the present time large amounts of chloride of potash, ketones, esters, acetic anhydride and iodine are produced. Altogether some 54 products have actually been made, though obviously not all of these will be profitable commercially.

Synthetic Acetic Acid.—The demand for war chemicals has stimulated numerous achievements in synthetic organic chemistry as used in manufacture. Many of these things are mentioned in texts as having been done in a small way in laboratories as chemical curiosities, for the purpose of throwing light upon chemical behavior in general and the properties of individual substances in particular. Transference of these ideas, for this is all it really amounts to, to production is the problem of industrial chemistry and chemical engineering. Many of these war developments cannot be discussed until those in charge feel that the proper time for publicity has arrived. One of them, however, which now appears a success, constitutes perhaps the best illustration of recent developments in North America. It is the making of acetone and acetic acid from acetylene, an achievement long desired.

The war demand by the British Government for acetone for cordite produced a serious shortage. Acetone is usually produced from acetate of lime obtained from the distillation of wood. Bacterial or other action on starch materials is not yet claimed as a success, though it was thought at one time in England that it would be the basis of the production of synthetic rubber. Another biochemical method has been developed on an enormous scale in this country for making acetone and acetic acid from molasses. By fermentation this goes into alcohol and vinegar; the latter upon neutralization with lime gives acetate of lime, as in the wood-distillation industry, to be used for the manufacture of acetone or acetic acid as required. Notwithstanding this process, however, all the acetone required was not immediately available. At Shawinigan Falls, Quebec, therefore, the opportunity came for successfully developing the production of acetone from acetylene, this process requiring nothing but limestone and coke for the manufacture of carbide. The carbide was converted into acetylene in the largest acetylene plant in the world. The acetylene was then ready for conversion into other chemical substances. The organic chemist has long been familiar with the attractiveness of acetylene as a raw material for many chemicals. At one time there were said to be two or three journals in Germany devoted exclusively to acetylene chemical propaganda and much chemical work was done, but not much of it proved ultimately commercial. It remained for the war to enable this continent to produce at high speed a plant which has been able to turn out 300 tons per month of acetone from acetylene.

The next step in the operation after the production of acetylene gas itself is the conversion of the acetylene to acetaldehyde in the presence of sulphuric acid and mercury salt in special acid-resisting metal apparatus. The acetaldehyde is oxidized to acetic acid in the presence of a catalyzer, and the acetic acid is then decomposed directly to acetone. It is interesting to know that the glacial acetic acid produced is 99 per cent. strong as it first runs from the stills. No other process gives such a product.

The demand for acetone has gradually been filled from many sources and this process immediately became available for the production of acetic-acid derivatives to be used in the manufacture of airplane dope (see *infra*) for the water-proofing and covering of wings, which have been producing at the rate of 700 to 800 tons per month for shipment to England and France. When the United States entered upon its airplane programme, it built an additional plant at Shawinigan Falls; the combined output will be the largest output of any glacial acetic-acid plant in the world. This line of work gives great promise for solving the problem of what we shall do for acetone and acetic acid when our waste wood has been entirely utilized. It may also give us the proper excuse for the real conservation of good wood now being wasted by distillation for the production of acetic acid. As raw materials become more and more scarce, the utilization of limestone and coke for the production of such a product is one of the most hopeful signs of the whole industrial-chemical war development.

Airplane Dopes.—The term "airplane dope" is applied to cellulose acetate or nitrate coatings for wing fabrics as distinguished from spar varnishes sometimes used as finishing coats. The dope is used to tighten up the fabric and gives a smooth, taut, waterproof surface resistant to the weather. The dope increases the tensile strength of linen fabrics about 25 per cent. and of cotton about 15 per cent.; the weight is increased from 3.5-4 ozs. per yard to 5.5-6 ozs. Dopes are made of cellulose-nitrate or pyroxylin and cellulose-acetate solutions. The former (about eight ounces per gallon) is dissolved in acetone or mixtures containing largely tetrachlorethane and alcohol. The latter is dissolved in solvents like amyl acetate or acetone and diluted with suitable non-solvent liquids. Other suitable substances, like castor oil, are added to modify the flexibility or shrinking power. Cellulose-acetate dope coatings are non-inflammable, but those obtained from pyroxylin are immediately ignited. A coating of three coats of the latter followed by two of the former is fire-resisting. Recently transparent cellulose-acetate sheets 1/100 in. thick and weighing nine ounces per square yard have been prepared. A tear started in such sheets spreads rapidly, but it has been proposed to reinforce them with a loosely woven fabric such as silk. Such material, if obtainable, would be an ideal wing covering.

Mixing in the Nitration Process.—Mixing by agitation as applied to liquids is a matter of great importance in the chemical industries. It is an astonishment even to chemists of ability who are not personally experienced in plant operation how everything may be properly set, raw materials right, and yet little or no product be obtained and nothing be salvaged of the original materials. A little thing like the lack of proper mixing may be the only flaw in the process, yet a perfect agitation machine has never been devised because every liquid mixture has its own peculiarities that require study.

One of the industries in which mechanical agitation is a vital problem is that of nitration for the production of explosives. The manufacture of such explosives as TNT (trinitrotoluol), picric acid and nitrated hydrocarbons involves the mixing of two liquids into intimate contact, one of which is of an oily nature not soluble in water and the other a mixture of acids very soluble in water. Under certain conditions the oily material is soluble in the acid material but ordinarily it is not. In addition, under certain conditions, when the reaction between the two materials has got well under way, any additional oil added enters into reaction with great speed, so that not infrequently the reaction becomes an explosive one; from time to time great damage has resulted to explosives plants from this cause. The problem is obviously one of adequate mixing and careful regulation of supply so that there may never be enough of one of the materials present suddenly to react in a violent manner after a delayed period.

A new nitrator is proposed which is an illustration of a type of agitator that has been used from time to time in other industries. It is now seized upon to give results of great promise in munitions manufacture. It consists of the usual tank-shaped nitrator containing heavy cooling coils of large surface. Tangentially attached to the sides of this tank are two tower-like tubes of the same height as the tank itself but connected with the tank only at the bottom and at the top. The bottom nozzle is comparatively small, and by the operation of propellers in the towers or tubes the mixture is forced at great speed tangentially out of the tower or tube into the bottom of the tank. This stream of mixed liquid is propelled from both sides of the tank in a tangential direction, giving the tank contents a swirling motion and forcing it over the dam at the top of the tank into or near the top of the side tubes or towers, thus maintaining a supply in the side towers for constant high-speed circulation. This circulation as ordinarily carried on amounts to about 5,000 gals. per minute or twice the volume of the nitrator. With this adequate agitation and proper regulation of the supply of cooling water and of the supply of oil to be nitrated, there is always a great excess of nitrating acid ready for every portion of oil as it enters the machine; in this way the nitration can be kept under strict and efficient control. In addition to the advantage of great capacity with safety, there are many chemical advantages, one of which is the absence of the proper conditions for the formation of other substances known to the chemist as side-products, materials which cut down his yields and sometimes are a source of danger as well as of expense.

Filter Presses.—Labor saving has always been an American object. No American familiar with chemical-engineering development ever doubted American ability to compete with German effort in dye manufacture in those cases in which tonnage production was required by the trade. Whatever might ultimately result from competition on small-scale manufactured products like synthetics, medicinals and dyes, it was always certain that American ingenuity in labor-saving machinery was more than a match for German cheap though intelligent labor. One of the places where labor saving shines is filter-press construction. The ordinary filter press consumes much time and labor in removing the filtered material. A number of methods have been worked out for meeting this condition. A recent one holds the whole press balanced on trunions. The press maintains the old plate and frame arrangement but with a control feed and discharge opening running through the press. In this rather large opening is a shaft to which are attached plows which deliver the cake to the central opening when the press has been swung into a vertical position. A slight air pressure behind the cloths serves to raise the portion of the cake left on them after stripping or paring against the edge of the paring device, which cleans the cloths with less wear than wire brushing. The material of the cake drops through the vertical opening and out to a chute at the point where the press follower was swung to one side to open the passage. Discharging is thus completed in a few minutes. For use again the follower is swung and screwed into place over the bottom of the vertical passage, sealing the opening and compressing the plates and frame joints throughout the press. The press is then swung into the horizontal position, when it is again ready for use in filtration.

The time saved by rapid removal of the cakes increases the number of hours per day which may be devoted to filtration with a given press, giving greater capacity or reducing press-size requirements. As the time of cake removal becomes a negligible factor, a higher rate of flow may be obtained in the case of materials that filter slowly by using narrower frames and thus forming thinner cakes, which may be profitably discharged more frequently than could be done in the ordinary type of press.

Miscellaneous Progress.—Bare mention of some other important advances is possible. The French have made great strides in chemical (glass) enameling of iron and we are expecting to surpass them in capacity with 250-gal. cast-iron stills. More rapid concentration of weak sulphuric acid by use of rotating dishes of quartz half in the acid and half in the heated evaporation gases in cascade silica-iron flue vessels is a novel step forward. Toluol fractionating columns, which not long ago were large when three feet in diameter, are now 90 in. in diameter and 65 ft. high, delivering 1,200 gals. per hour. The making of paper from sugar cane, to be tacked down over new seedlings, which bayonet their way through while the weeds, raised in the dark beneath the paper are too weak to break through, will revolutionize yield and labor in sugar raising in the tropics.

The Perkin Medal award of 1918 was made to Auguste J. Rossi for his distinguished contributions to the metallurgy of titanium.

Publications. — Among the important technical papers of the year may be noted: "Recovery of Light Oils and Refining of Toluol to Meet Military Needs" (*Jour. Ind. and Eng. Chem.*, 1918, pp. 51, 111); "Amylacetate and Similar Solvents from Petroleum" (*ibid.*, 511); "The American Garbage Disposal Industry" (*ibid.*, 480, 565); "Synthetic Phenol" (*ibid.*, 738); "Dyeing of Khaki in the United States" (*ibid.*, 640); "The Ammonia Problem" (*ibid.*, 202); "Platinum Shortage" (*ibid.*, 95, 336, 420); "War Chemistry" (*ibid.*, 93); "Methods of Gas Warfare" (*ibid.*, 297).

PHYSICS

E. L. Nichols

Heat.—Young's modulus and the coefficient of expansion of tungsten wire have been measured by H. L. Dodge (*Phys. Rev.*, xi, 311) up to 800° C. Unlike aluminium, copper and steel, in which reduction in the elasticity proceeds at a rapidly increasing rate on moderate heating, tungsten shows a uniform decrease of the modulus with temperatures up to nearly 1,000°. The thermal expansion was likewise practically uniform. The coefficient was 0.00000456, a value which is consistent with that found by Worthing for similar material but which differs by 50 per cent. from the expansion of the wires studied by Langmuir.

The atomic heat of solids at very high temperatures is of special interest because of its bearing upon the theories of Einstein, Debye and others. These theories lead to the conclusion that at high temperatures atomic heat at constant volume should reach a constant value of 5.95 calories. Many substances, however, are known to have a higher specific heat than this. The perfection, in recent years, of methods of measuring high temperatures has made it possible to extend such investigations to incandescent solids, and A. G. Worthing (*ibid.*, xii, 199), improving upon the attempts of Corbino and of Pirani, has determined the atomic heats of carbon to 2,100° abs. and of tungsten to 2,500° abs. The method consists essentially in heating a filament electrically *in vacuo* to the desired temperature, suddenly changing the resistance of the circuit and determining the resulting changes in temperature, radiation, supply of energy to and storage of energy in the filament. These changes depend in part upon the specific heat of the substance, which may thus be computed.

It was found that the atomic heat approaches the value demanded by theory for carbon but that in the case of tungsten the values were in considerable excess. Since similar excesses have already been recognized in other substances, extensions of the theory to explain this phenomenon seem to be demanded. By prearrangement with Worthing a parallel set of experiments has been made by P. F. Gaehr (*ibid.*, xii, 396) in which an alternating current giving a sine-wave variation was employed instead of the sudden change used by Worthing. The results are in the main concordant.

Katara Honda (*ibid.*, xii, Dec., 1918) has studied the relations between the melting point, the heat of fusion and the frequency of molecular vibration of various elements and compounds. Omitting those cases in which the specific heat is abnormally large, he finds that unless some transformation takes place in a substance during fusion the heat of fusion goes mainly to the production of rotational energy of the molecules during the process of melting.

Electricity.—Nernst's theory of the galvanic cell, as has been pointed out by Lehfeldt and others, is open to serious objection on account of the incredible values of the so-called solution pressures required, *e.g.*, 10^{44} atmospheres in the case of magnesium in a normal solution of its salt. D. L. Ulrey (*ibid.*, xii, 47) proposes a theory free from these difficulties, namely, that the transfer of ions between the metal and the electrolyte in a galvanic cell is brought about by electrical forces that depend upon the specific inductive capacity of the medium. He establishes this assumption by measurements of the electromotive forces of cells in which identical electrodes are immersed in various mixtures of two liquids the specific inductive capacities of which are known. The best results were obtained with mercury electrodes protected by a layer of mercurous chloride in which cases the potential differences were strictly proportional to the difference in the specific inductive capacities of the solutions.

Insulating materials are, generally speaking, conductors having very high electrical resistance at low temperatures and very large negative coefficients of resistance. When excessive potential differences are applied to such insulators, the internal heat generated raises the temperature and thus lowers the resistance, so that the current increases until the material is fused or fractured. F. W. Lyle (*ibid.*, xi, 253) shows by experiments with boron insulators that the minimum voltage which will produce a "break down" depends on the relative rates of heat production and heat dissipation. Below a certain critical voltage thermal equilibrium is reached and the insulator will stand up permanently. At higher voltages the temperature continues to rise until "break down" occurs.

Magnetism.—W. R. Wright (*ibid.*, xi, 161) has studied the magnetization curves of a series of steels at temperatures from the Curie point downward. Hysteresis was effectively eliminated by the superposition of an alternating field. The curves for constant magnetizing field show two transformation points: one just above 700° which corresponds to the precipitation of the carbides, and one at about 200° which is the temperature of the magnetic transformation of cementite as determined by Honda. As the irregularities indicative of these transformations vanish in the curve for pure iron, they are properly ascribed to the presence of carbon. The empirical formula proposed by Froehlich does not fit these anhysteric magnetization curves, nor does Ashworth's equation for the relation of magnetization to temperature.

According to the "magneton" theory, the magnetic susceptibility of paramagnetic substances should be inversely proportional to the absolute temperature. E. H. Williams (*ibid.*, xii, 158) has measured the susceptibility of seven oxides of the rare earths by Curie's method between 20° and 300°, with special reference to the validity of Curie's law. Of these lanthanum oxide was diamagnetic, the susceptibility of yttrium was exceedingly small, and that of samarium did not vary perceptibly with temperature. The oxides of neodymium, gadolinium, dysprosium and erbium were paramagnetic, and for these the variation of the susceptibility (X) was found to agree with the modification of Curie's law developed by Oosterhuis and by Kunz, *i.e.*, $X(T+O) =$ constant. The constant O has a different value for each material.

S. J. Barnett, whose demonstration of the production of magnetization by rotation was mentioned in the YEAR BOOK for 1917 (p. 621) has been awarded the Comstock prize of the National Academy of Sciences for that investigation. The converse experiment, based upon the suggestion, made by O. W. Richardson in 1908, that a piece of soft-iron wire suspended vertically within a vertical solenoid should tend to rotate when magnetized, has been successfully performed by J. Q. Stewart (*ibid.*, xi, 100). The measurements appear to confirm Barnett's experimental result, *i.e.*, that the effect observed is about one-half that required by Richardson's theory. It may be explained by assuming a rotation of the positive nucleus of the atom in the opposite direction to the rotation of the negative electrons.

In 1912 Barnett showed by very precise measurements that a cylindrical condenser placed in a uniform magnetic field, when short circuited and rotated upon its axis, becomes charged to a potential difference equal to the rate at which the short-circuiting wire cuts magnetic flux, whereas if the condenser and wire are fixed and the agent producing the magnetic field rotates, the relative motion being the same as before, the condenser does not become charged. He has now extended the demonstration to the experimentally much more difficult case of translatory motion (*ibid.*, xii, 95) with a similar result. Both forms of experiment seem to support the hypothesis of electromagnetic induction through the ether and to oppose the theory that the effects depend solely on the relativity of the motions of condenser and magnetic field.

Ionization.—When α rays, produced by exposure to polonium, strike an insulated metal surface in a high vacuum the metal becomes positively charged. This charge is partly due to the emission of negatively charged electrons. To determine whether these electrons are from the metal itself or from a gas film on the surface, as appeared to be indicated by previous experiments of Bumstead and McGougan, A. G. McGougan (*ibid.*, xii, 122) has tested the effect of scraping the metal surface while *in vacuo*. He found that in all the metals studied the emission was temporarily greatly reduced by scraping but returned gradually to its original value. It seems probable that the gas film is derived from gases absorbed in the metal rather than from the vacuum, especially as Pound had previously shown the absence of such emission from metal surfaces produced by distillation *in vacuo*.

To determine whether ions are single molecules carrying an electric charge, or whether, as has been quite widely maintained, they consist of clusters of molecules, Kia Lok-yen (*ibid.*, xi, 337) has redetermined the mobilities of the ions in air, hydrogen and nitrogen. If the ions are groups of molecules, these would disintegrate when a certain, determinable kinetic energy is imparted to them, with a resulting change in their mobility. Kia finds no indication of such an effect and concludes, in confirmation of the results of Wellisch and of Loeb, that ions are molecules from which a single negative electron has been detached or to which an additional electron has become attached.

There has been recent controversy as to the minimum potential difference at which ionization occurs in mercury vapor. T. C. Hebb (*ibid.*, xi, 170) confirms the lower value of 4.9 volts recorded by Franck and Hertz and by Newman. He describes experiments which seem to preclude the suggestion that the ionization observed at this low potential is a secondary effect due to photo-electric action, and shows that the minimum at which an arc can be produced varies with the temperature of the Wehnelt kathode, the temperature of the furnace, the pressure, the distance between kathode and anode, and the purity of the mercury vapor.

This problem is intimately related to the more general one of the character of the impact between electrons and gas molecules. J. M. Benade and K. T. Compton (*ibid.*, xi, 184, 234) have developed a theory of such impacts according to which the loss of energy by an electron from collisions should be very small in monatomic gases and much greater in heavy complex gases of multiatomic structure. They have also succeeded in showing, by an ingenious experimental method of exceeding delicacy, that the helium atom is practically of perfect elasticity, the coefficient of restitution being greater than 0.9999, so that the only loss of energy to the electron is that due to the motion imparted to the atom by impact. In hydrogen and oxygen the losses were much greater than in helium, and it is probable that in gases of multiatomic structure the energy lost by the electron appears as vibration of the parts of the molecular complex.

Tate and Foote of the U. S. Bureau of Standards (*Philos. Mag.*, xxxvi,

64) distinguish two types of inelastic collision between electrons and atoms—those encounters which are attended by radiation of a single frequency without ionization of the gas, and those which ionize the gas and excite radiation, giving a composite spectrum. The potential giving the first type of encounter, which may be termed a resonance potential, may be computed from the well known quantum relation $hv = eV$ where v is the frequency of the monochromatic radiation excited by the potential V. The ionization potentials likewise satisfy the above equation, where v is the limiting frequency of the series of lines excited by the potential V. The authors have determined experimentally the resonance and ionization potentials for the vapors of cadmium, sodium, potassium and zinc. The apparatus consisted of a hot kathode in a vacuum tube containing the vapor of the metal. This was surrounded by a cylinder of nickel gauze and this by a cylinder of sheet nickel. The curves of the current reaching the solid cylinder against a suitable retarding potential, when the accelerating potential was varied, show a series of maxima differing from the ionization potential by multiples of the resonance potential. From these curves resonance potentials and ionization potentials could be determined. The results are in excellent agreement with the corresponding values calculated from the quantum relation using the known frequencies of the radiation. The coincidence between observed and calculated values is held to be a convincing proof of the correctness of Bohr's atom. That structure, however, fails to satisfy various theoretical physicists. G. A. Schott (*ibid.*, 243), for example, finds Bohr's hypothesis of "stationary states of motion" incompatible with the electromagnetic equations of Maxwell; L. Vegard (*ibid.*, 293) finds it necessary to introduce new assumptions to fit the phenomena of X-ray spectra. Numerous recent investigations indeed show that much still remains to be done in this highly speculative field.

X-rays.—That positive rays are capable of exciting characteristic X-radiation is demonstrated by M. Wolfke (*ibid.*, xxxv, 59) in the case of tin and lead. The wave lengths have not yet been measured but they are thought to be those of K-rays. The only secondary effects of positive rays hitherto recognized were the slow-moving electron rays and very soft X-rays recently described by J. J. Thomson.

Elmer Dershem (*Phys. Rev.*, xi, 461) has determined the wave lengths of the X-ray spectrum of tungsten by a photographic method. His plates show 19 lines of the L-radiation lying between 1.02 and 1.48 Angström units. The wave-length measurements, for which an accuracy of 0.1 per cent. is claimed, are in excellent agreement with those of Siegbahn and Friman for the nine lines measured by them. The apparatus gave excellent resolution of the two doublets in the K-radiation of tungsten, even in the spectra of the first order.

In addition to the lines of the so-called L- and K-radiation there is a region of continuous radiation lying approximately between 0.2 and 1.0. The distribution of energy in this region has been determined by C. T. Ulrey (*ibid.*, xi, 401) by the ionization method. The distribution curves for Pt, W, Pd, Mo, Ni and Cr are strikingly similar to the curve for black-body radiation, with a single well defined crest and a steeper slope towards the shorter wave lengths. There is a slight shift of the crest towards shorter wave lengths with increasing atomic weight, and for a given element, as tungsten, there is a displacement of the maximum in the same direction with increasing voltage. The displacement law, however, differs from that for temperature radiation in that

$$\lambda_{max} V^{1/3} = \text{constant.}$$

These distribution curves are identical in type with those of simple fluorescence bands, and the continuous radiation may doubtless be regarded as luminescence of exceedingly short wave length.

Optics.—By means of a rapidly revolving wheel, on the rim of which ten mirrors are mounted obliquely, like the paddles of a water wheel, Q. Marjorana (*ibid.*, xi, 411) has shown that the velocity of light reflected from a surface moving in the line of sight is not affected by the motion of the reflector. The wave length as determined with an interferometer after successive reflections from several of these mirrors when the wheel was at rest and in motion was found to vary by an amount corresponding to unchanged velocity of the ray, and direct experimental verification was thus afforded of a conclusion which is of fundamental importance in the theory of light and which confirms previous work on the Doppler effect and on canal rays.

As a result of a comparison of the iron spectrum in various flames and in an electric tube furnace, A. G. Hemsalech (*Phil. Mag.*, xxxv, 209) concludes that the spectra obtained from the furnace up to a temperature of about 2,400° C. are caused by the action of heat on a chemical compound of the metal and not on the free metal itself. Hence these spectra are not of purely thermal origin. At 1,500° the spectrum is the same as that obtained by the use of an air flame burning in coal gas. The spectra emitted by iron compounds in flames are the same as those given by the furnace at the same temperatures up to 2,400° and are independent of the nature of the chemical compound. It is doubtful whether the iron atom is actually liberated even up to 2,700°. The compound seems to continue to exist and retain its individuality. Under the action of the powerful electric forces of the arc or condenser spark the iron atoms are set free and vibrate without restraint, giving the characteristic arc or spark spectrum.

Whether the coefficient of absorption of metals is the same when the metallic surface is in contact with a transparent medium such as glass as when the incident light enters the metal directly from the air, is a question of importance in optical theory. The data are conflicting. J. B. Nathanson (*Phys. Rev.*, xi, 221), in a study of the optical properties of rubidium, finds that the absorption coefficient is modified by contact with glass. The earlier results of R. W. and R. C. Robinson for potassium and of Tate for silver indicate analogous changes in the case of those metals. The reflecting power of rubidium increases steadily from about 75 per cent. in the blue to 83 per cent. in the red end of the spectrum.

Luminescence. — The double chlorides of uranyl are remarkable for the regularity and symmetry of their narrow-banded spectra. Measurements of their fluorescence and absorption bands by Nichols and Howes (*ibid.*, xi, 285) indicate (1) that the frequency interval is nearly the same for all series of a given salt and for each of the four compounds studied; (2) that the position of the bands in the spectrum shifts towards the violet with increasing molecular weight; (3) that the individual bands, both of fluorescence and absorption, as they appear when observed at +20° are really complex, being resolved into two or more narrower components when the salt is cooled to the temperature of liquid air; (4) that the composition of the bands is analogous but not identical in the different salts; (5) that the average frequency intervals of these components is the same as for the unresolved bands; (6) that all absorption bands lying towards the violet from the reversing region form series with a constant frequency interval, and that for every fluorescence series there is a corresponding and related absorption series.

The afterglow of the uranyl compounds when excited in the usual manner, *i.e.*, by exposure to violet, lasts for less than five hundredths of a second. Misses Wick and McDowell (*ibid.*, xi, 431) have discovered, however, that when excited by kathode rays at the temperature of liquid air, the phosphorescence of certain of the double salts is of long duration, being of measurable intensity for several seconds. Nichols, Howes and Wilber (*ibid.*, xii, 351) obtain similar results with calcite from Franklin Furnace. This calcite, which owes its luminescence to traces of manganese, phosphoresces for about half a second after excitation. When bombarded by kathode particles, even at ordinary temperatures, the duration is at least 300 sec. Since in the case of both uranyl salts and calcite the law of decay of the fleeting phosphorescence differs altogether from that of phosphorescence of long duration, they define the two types (*Proc. Nat. Acad. Sci.*, iv, 305) as "vanishing phorphorescence," in which the diminution of intensity is at first slow and becomes progressively more rapid, and "persistent phosphorescence," in which the decrease is initially rapid and becomes progressively slower.

Miss Frances G. Wick (*ibid.*, xi, 121) has measured the relative brightness of the fluorescence bands of various uranyl salts when excited at +20° C. and has plotted the enveloping curves. The envelopes are all of the same type—single crested with the steeper slope towards the violet, as in the distribution curves of single homogeneous bands and of black-body radiation, which they greatly resemble.

The crests are all in the blue-green of the spectrum, between 0.50 μ and 0.52 μ. For a given family of salts, such as the double sulphates, the double nitrates or the acetates, they are very nearly at the same wave length, but with increase in the molecular weight of the acid radical there is a shift of the crest toward the longer wave lengths. Detailed spectrophotometric measurements reveal the very complex structure of the individual bands in these fluorescence spectra even when, as in most cases, the components are not distinguishable to the eye.

In a theoretical paper based on thermodynamic considerations, E. H. Kennard (*ibid.*, xi, 29) developes a relationship between fluorescence and the radiation from a black body for which he finds confirmation in earlier experimental results. He proposes a modification of Kirchhoff's law such that in different substances at the same temperature the absorption is proportional to the sum of the thermal and fluorescent emissions at each wave length. Assuming that thermal emission and fluorescence are thermodynamically independent, so that the energy of fluorescence is derived entirely from the exciting light and is proportional to the excitation, it follows that the intensity at any point in a homogeneous fluorescence band is proportional to the intensity in the black-body spectrum at that point multiplied by the power of light of that wave length to excite the band.

To expose the vapor of sodium to the radiation of one of the D-lines of sodium to the complete exclusion of the other, and to obtain a satisfactory record of the resulting resonance spectrum, is a matter of very great experimental difficulty. This has been accomplished at least with sufficient nearness by Wood and Mohler (*ibid.*, xi, 76) to warrant the conclusion that the resonance spectrum, when excited by one of these lines, contains both lines only in the presence of an electropositive gas, in this case Na vapor or hydrogen. In this respect the behavior of Na vapor agrees with that previously established for the vapor of iodine.

The above investigation involved a knowledge of the relative intensities of the D-lines, and these have been redetermined for varying brightness of the sodium flame by V. Voss (*ibid.*, xi, 21). He finds that with a very bright flame, D_2/D_1 is 1.25, and with a diminishing intensity of the flame the ratio approaches two as a limiting value.

The latest chapters of Wood's investigation of the remarkable fluoresence spectra of vapors deal with the series law for the doublets of the spectrum of iodine when excited by the green line of the mercury arc. In company with M. Kimura (*Philos. Mag.*, xxxv, 252) the high dispersion photographs of this spectrum have been measured and discussed. It is found that the spacing of the doublets, of which 27 are recorded, is such that the frequency difference is constant throughout the spectrum—a relation, by the way, which has long been known in the case of the fluorescence of certain uranyl salts, while the frequency difference between homologous components is likewise constant as in the case of the uranyl compounds.

Electrons.—Calculations based upon the observed value of the coefficient of absorption of aluminium for X-rays and *gamma* rays, and upon the relative scattering of such rays on the incident and emergent side of the plate have been made by A. H. Compton (*Phys. Rev.*, xi, 330). He finds that the experimental data are best accounted for if the electron has a radius of about 2.5×10^{-10} cm. and is ring-shaped rather than spherical. The ring-shaped electron likewise affords an explanation of Forman's observation that iron has a greater absorption coefficient for X-rays when magnetized parallel to the direction of the transmitted rays.

A. J. Dempster (*ibid.*, xi, 316) has perfected a method of sorting the positive particles in a discharge tube by deflection in the magnetic field. The radius of curvature of the path of the particles gives the ratio of charge to mass, and the sensitiveness of the method is such that it is hoped to apply it to such questions as that recently suggested by Soddy, *i.e.*, that when the atomic weight of an element departs widely from an integral value, the substance will be found to be a mixture of isotropes.

The Quantum Theory.—All derivations of Planck's law of radiation have hitherto been based upon some form of quantum theory, and it has been assumed that this well known equation can be proved only on that basis. F. R. Bichowsky (*ibid.*, xi, 58) points out that all such proofs are likewise based upon the assumption that the radiating system has the statistical properties of a perfect gas. If, instead, we assume that the radiating system is such that radiation is not given off until the energy of the system reaches a certain minimum or threshold value, and thereafter continuously, the derivation of Planck's law follows directly, by the use of the established principles of classical mechanics.

R. C. Tolman (*ibid.*, xi, 261) approaches the question of the relation of classical mechanics to relativity and the quantum theory from a different side. He considers the absorption and emission of radiation in quanta to be a fundamental fact experimentally established by the study of the photo-electric effect, but shows that the equations of statistical mechanics may still be given the well known Hamiltonian form by admitting that energy is not necessarily a homogeneous quadratic function of the generalized coördinates and that Newton's laws of motion are an approximation strictly applicable to low velocities only.

Sound.—In 1916 G. Banerji discussed the origin and characteristics of the sound produced by the collision of two solid spheres. In a later paper (*Phil. Mag.* xxxvi, p. 97) the cases of spheres of unequal sizes and of different materials are considered. The sound is not due to vibrations set up in the spheres, since for the dimensions used such waves would have a frequency above the auditory limit. They are due to aerial waves produced by the sudden reversal of the motion of the spheres as a whole. The intensity of the sound transmitted in various directions was measured, and diagrams are shown from which it appears that the intensity is a maximum in the line joining the centers of the spheres and falls away rapidly and symmetrically about the axis. There are two zones of zero intensity at an angle of 67° and a narrow zone of lateral transmission at 90°.

XXIV. THE BIOLOGICAL SCIENCES

ORGANIC EVOLUTION[1]

H. S. Jennings

General Survey.—No diminution in work in the field of evolution and heredity as a result of the war is yet evident in America; there has been great activity both in concrete investigations in heredity and variation and in discussion of the method of evolution. Theories of evolution have now come to depend so closely upon the results of investigations in heredity and variation that it appears desirable to reverse the order adopted in previous reviews in the Year Book and summarize first the concrete researches in genetics.

Heredity. — The outlines of the method of heredity have now been established on the lines first indicated in Mendelism—the separable inheritance of many of the traits of organisms; the dependence of these on separable substances (genes) visible as paired chromosomes in the nuclei of the germ cells; the separation and recombination of the traits in passing from parent to offspring according to the numerical rules given by the behavior of the chromosomal genes in the formation and union of the germ cells; the clinging together of the inherited traits in groups corresponding to the groups of genes formed by the pairs of chromosomes, with the occasional crossing over of a gene from a given chromosome to another member of the same pair; the dependence of certain traits on several separable genes; the fact that single genes often (always?) affect several or many traits. Interest now centers about phenomena not evidently conformable to this schema or bearing upon disputed points in connection with it.

Observed Behavior of the Genes.—Concerted researches of great interest as to the actual behavior and distribution of the chromosomes in the passage from one generation to the next have been published from the Zoölogical Laboratory of the University of Pennsylvania (mainly in the *Journal of Morphology*). Among these is notable the paper of Miss Carothers demonstrating the independent separation and recombination of the members of different chromosomal pairs, phenomena which had been predicted from the corresponding behavior of adult traits, but not before clearly observed. Richards (*Biol. Bull.*, 1917) shows that in certain fish it is possible to trace individual chromosomes as such through every stage from one cell-generation to the next, thus directly demonstrating the continued individuality of the chromosomes. Pinney (*Jour. Morph.*, 1918) and Newman (*Jour. Exp. Zoöl.*, 1918) study the fate of the paternal chromosomes in the hybrids of certain fish, in which the offspring are prevailingly like the mother. They show (as has been shown for other similar cases) that the chromosomes of the father become inactive in the foreign cytoplasm of the egg of the other species; they may become abnormal or degenerate (Pinney). In so far as the paternal chromosomes remain active they produce abnormalities in the later development.

A number of authors, including Lutz (*Am. Jour. Bot.*, 1917, and *Am. Nat.*, 1917), Hance (*Genetics*, 1918) and Tupper and Bartlett (*ibid.*, 1918) have continued the study of the abnormal numbers and distribution of chromosomes in *Oenothera*, on which some of the peculiar hereditary changes in that plant have been shown to depend.

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[1] This review covers both 1917 and 1918, as a summary for 1917 was unavoidably omitted from that issue of the Year Book.

Behavior of the Genes as Discovered from the Results of Breeding.—Bearing hardly less directly on the mechanism of heredity than actual observations of chromosomal behavior are the numerous researches and discussions on the grouping of the genes and their relative locations within the chromosomes. The fruit fly *Drosophila* continues to be the most favorable field for these studies. Knowledge of "linkage" of genes resulting from their grouping in chromosomes has been extended during the two years to a number of other organisms, but in no other case has the complete linkage system been worked out and its correspondence with the chromosomal system laid bare, as has been done for the fruit fly. In the latter organism the researches of Morgan and his associates have brought evidence that particular genes have precise locations in particular chromosomes, any given gene maintaining its relative position with reference to others. This, with the observed fact that the chromosomes are linear aggregates at the critical periods of pairing and redistribution, has led to the conception that the genes are arranged in linear series from end to end of the chromosomes, like strings of beads. Such greatly extended strings are observed, in the formation of the germ cells, to partly unite side by side in pairs, then to separate again. By the assumption that in this pairing process they may break in certain regions and the two parts "change partners", the facts of "crossing over" are explicable; that is, the fact that two genes at first together in a single chromosome may after this pairing be separated, one being now in the other member of the pair. Bridges (*ibid.*, 1917) found that in a certain strain of the fruit fly one of the chromosomes had in some way completely lost one of its genes. If this meant the actual destruction of a part of the chromosome, it appeared that other genes which previous study had shown to be located near this one should be lost also. Investigation showed that this is actually the case; when a gene is lost, others located near it are lost too.

The studies of "crossing over" promise to bring us in closer touch with the actual details of the hereditary mechanism than any other phenomena now under examination. Goldschmidt (*Jour. Exp. Zoöl.*, 1917) proposed to replace the theory of linear arrangement of the genes (with occasional breaks between them during pairing) by one dealing only with chemical attractions and repulsions of varying strength. The analyses by Sturtevant, Bridges, Jennings (in *Genetics* and the *American Naturalist*) show that this theory in the form proposed is not compatible with the observed data of crossing over. Weinstein (*Genetics*, 1917) shows in extensive investigations that crossing over between particular genes that are close together (that is, that are rarely separated from each other by the breaks that occur) makes the crossing over between two neighboring genes less frequent; the extent of this "interference" is measured, and it is shown how this may result from the method of pairing and breaking of the chromosomes. Plough (*Jour. Exp. Zoöl.*, 1917) shows that alteration of temperature affects the frequency of crossing over in one of the pairs of chromosomes of the fruit fly, and that this occurs only when the subjection to changed temperature (which may be for but a brief period) occurs at the particular stage in the development of the germ cells when the paired chromosomes are drawn out to form thread-like linear aggregates. This indicates therefore that crossing over, and hence the general distribution of the parental genes to the offspring, occurs at this stage.

Nature of the Genes.—Much discussion has centered about the essential nature of the genes and their method of action in determining the later hereditary traits. Morgan (*Am. Nat.*, 1917) gives a valuable summary and discussion of our present experimental knowledge on this point. The physicist Troland (*ibid.*, 1917) shows that the existence of such separable, self-reproducing masses of specific substances, displaying the properties and behavior required of the genes by the results of experimentation in heredity, is not opposed to the remainder of our knowledge of physical chemistry, as has been asserted, but is in thorough consonance with it. He holds that the genes are enzymes and accounts for their properties on this basis. R. F. Lillie (*Biol. Bull.*, 1918) discusses in the light of physical chemistry the phenomena of self-conservation and proliferation as manifested in heredity, and argues that electrical conditions are here primarily at work; he does not deal with the observed specific mechanisms. Dunn (*Am. Nat.*, 1917) combats the view sometimes put forward that the "species inheritance" or "type inheritance" is carried by the cytoplasm, only some details being dependent on the chromosomal genes; he marshals evidence which he believes to show that practically all heredity depends upon the chromosomal substances (that is, that all diversities of inheritance are the result of diversities in the chromosomal substances). The same view is urged by Morgan (*ibid.*, 1917). Goodspeed and Claussen (*ibid.*, 1917) present a *résumé* of evidence drawn from crosses between distantly related forms, showing that beside the common diversities of genes in Mendelian inheritance, there must be recognized a partial or total incompatibility between the system of genes of a given species and that of another species. There results much abnormality in hybridizing distant organisms; the scheme of heredity is quite diverse from that exhibited when closely related forms are paired. The works of Pinney and Newman, already mentioned, with much other work on hybrids, tends in the same direction.

Later Hereditary Traits. — The method of interaction of the genes with each other, with the cytoplasm, and with the agencies of the environment, to produce the later appearing traits of organisms constitutes a field of research yet little touched. On the other hand, concrete investigation on the inheritance of the later traits has been exceedingly active; numerous technical researches are found in *Genetics*, *Journal of Genetics*, *Journal of Experimental Zoölogy*, *American Naturalist* and elsewhere. The researches of Morgan and associates on *Drosophila* continue to be perhaps the most fundamental studies of inheritance. Other noteworthy contributions are the following: Davenport's study (*Genetics*, 1917) of the inheritance of stature in man (see also XXVI, *Anthropology*); the studies of the inheritance of variegation in plants (mainly in *Genetics*) by Emerson, Hayes, Ikeno; Nabour's continuation of his investigation of inheritance in grasshoppers (*Jour. Genetics*); numerous studies of the factors determining the inheritance of egg production in the fowl by Harris and Blakeslee (*Jour. Exp. Zoöl.*) and by Goodale (*Am. Nat.*); Wright's papers summarizing the complex inheritance of color characters in mammals (*Jour. Heredity*), etc. Investigation of the remarkable genetic phenomena of *Oenothera*, on which the mutation theory was originally based, has continued actively. De Vries (*Genetics*) and La Rue and Bartlett (*ibid.*) have continued in various species of the genus the description of mutations, progressive and retrogressive, and particularly of "mass mutations"—cases in which a large proportion of the individuals of the new generation transform. Davis (*ibid.*), Atkinson (*ibid.*) and De Vries (*ibid.*) continue the study of hybridization in the genus, particularly with relation to the thesis of Davis and others that the aberrant genetic behavior of the group is due to hybridization. What may turn out to be a most important light on the phenomena in *Oenothera* has been given indirectly by the researches of Muller on *Drosophila* (*ibid.*). In this animal not infrequently a portion of one chromosome becomes so altered that it no longer suffices to keep the animal alive unless the corresponding part of the other chromosome of the pair is normal; genes so altered are called lethals. If both chromosomes of a given pair have the same lethal, of course the individual bearing them never develops. Muller finds that sometimes one of the two chromosomes of a pair possesses a lethal in one part, the other in another part. Each thus supplies the deficiency of the other, and the organism develops. But when in the passage to the next generation all possible combinations of these two kinds of chromosomes occur, including the infrequent crossing over of the lethals or other genes, a whole series of extraordinary phenomena, much resembling those in *Oenothera*,' result (and necessarily so). At rare intervals (but repeatedly in about the same proportions, as in *Oenothera*) there come to light traits that have been hidden for many generations, just as do the "mutations" of *Oenothera*. Crosses with other races give in some cases "twin hybrids", in others "multiple hybrids", just as in *Oenothera*. The productivity of the stock is greatly decreased, as is the case in *Oenothera*. All these phenomena occur "according to prediction based on the factorial composition" of the organisms (known in the case of *Drosophila*). It appears probable that it is something of this sort that "lies at the root of nearly all the unusual phenomena" in *Oenothera* (Muller). If this is correct, the so-called mutations of *Oenothera* are not evolutionary changes at all. But as is pointed out by Muller, and also by Morgan (*Sci. Monthly*, 1918), in other organisms, notably *Drosophila*, many actual changes ("real mutations") are now known, so that the "mutation theory" remains intact.

Extended mathematical analyses of the results of Mendelian inheritance continued through many generations according to various systems of breeding (random mating, selection, self fertilization, assortative mating, inbreeding, etc.) have been published by Jennings, Robbins, Warren, Pearl (in *Genetics* and *American Naturalist*). Contributions to the statistical treatment of the data of genetics are to be found in *Biometrika*, other such contributions have been published by Harris, Pearl, Wright (mainly in *American Naturalist*).

A most excellent textbook presenting the present state of the science of genetics has been published by Babcock and Claussen (1918).

Sex.—In organisms in which the two sexes are represented by diverse individuals, sex is known to be typically inherited on the Mendelian scheme—the diversity of sex resulting from a diversity of chromosomes, so distributed that one-half of the germ cells receive the combination giving the male, the other half the female. From this results the approximately equal numbers of the two sexes. Many researches of the last two years confirm this typical schema. The diversity of chromosomes is at bottom of course a chemical diversity; other recent papers of great interest indicate that this underlying chemical diversity is producible in other ways, resulting in the control of sex by other factors. Lillie (*Jour. Exp. Zoöl.*, 1917) publishes the details of his extensive investigations showing that, in cattle, circulation during embryonic life of the fluids from the male member of a pair of twins in the body of the originally female twin results in the partial transformation of the latter into a male. The reverse transformation does not occur (although there is a reciprocal interchange of the circulatory fluids), apparently because the male characters are those that develop first. Riddle (*Jour. Wash. Acad. Sci.*, 1917) summarizes his extended investigations on sex in the pigeon. In certain crosses, eggs that produce males are more abundant in the early part of the season; those that produce females later in the season. Particularly is this true if the mother has been induced to nearly exhaust herself by laying many eggs; in this case the proportion of female-producing eggs becomes very high. Analysis shows that the eggs which produce females have more storage protein and a smaller proportion of water than those which produce males; they are likewise actually larger. Riddle considers it demonstrated that eggs which, so far as chromosomal constitution is concerned, would produce males, have been transformed into female producers. Goldschmidt (*Jour. Exp. Zoöl.* and *Biol. Bull.*) publishes further accounts of his researches showing the existence of intergradations between the sexes in the gypsy moth; with a theory to the effect that the diversity of sex is due to diverse quantities of two substances that are present in all individuals—a preponderance of one of these producing a male, of the other a female, while a more or less balanced condition results in intergradations. It should be remarked that some investigators hold the facts described by Riddle and Goldschmidt to be possibly explicable as the consequence of abnormal distributions of the chromosomal sex determiners; or of a selective action which permits germs of one sex to develop while others do not (*cf.* Morgan, *Am. Nat.*, Sept., 1917).

In the white rat Miss King (*Jour. Exp. Zoöl.*, 1918) finds that by selection it is possible to isolate stocks, one of which produces regularly a preponderance of males, the other a preponderance of females (though in neither case is the preponderance very great). Warren (*Biol. Bull.*, 1918) shows that a similar diversity in the proportions of the sexes in different stocks of *Drosophila* is due to the fact that the chromosomal combinations that would give the male sex do not live. Whitney (*Jour. Exp. Zoöl.*, 1917) and A. F. Shull (*ibid.*, 1918) show that in *Rotifera* the individuals of a given generation will be preponderatingly male or female, depending on the kinds of food and the amount of oxygen supplied to their female grandparents. In *Crepidula*, a mollusk in which the same individual is successively male and female, Gould (*Jour. Exp. Zoöl.*, 1917) shows that the presence of a larger individual (usually female, but a large male has the same effect) near the young specimen causes it to develop into a male; without this stimulus it remains for a time neutral, then becomes a female. Whether any or all these results are brought about through the chromosomal mechanism, or by replacing or transforming its action, is not known. A valuable review of sex control in relation to man is given by Schultz (*Biol. Bull.*, 1917).

Inbreeding.—Miss King has published the results of her long extended researches on the consequences of inbreeding in the white rat (*Jour. Exp. Zoöl.*, 1918). Contrary to popular impression, but in accord with other (though less extensive) research, it was found that close inbreeding for long periods (25 successive generations) does not result in degeneration. At the end of 25 generations the animals were larger and more vigorous than those not inbred.

Variation.—On no subject has there been more research and discussion than on the constancy or variability of the hereditary constitution (the genes) and on the nature of the hereditary changes that occur. A number of investigators support the contention of the Hagedoorns: "We know that all the different genes . . . are each in themselves invariable" (*Am. Nat.*, July, 1917, p. 390). But examination shows such support to be largely conceptual; it merely means that after a gene has changed it is another gene; as one might say that each direction of the wind is invariable, since when it has changed it is another direction. All admit that the genes do change; Morgan, while supporting in some passages the "constancy of the genes" (see *Sci. Monthly*, May, 1918), asserts that "the actual evidence from multiple allelomorphs shows that genes may mutate in all directions" (*Am. Nat.*, Sept., 1917). The number of hereditary changes in the genes observed in the single organism *Drosophila* runs into the hundreds; and as other organisms are studied with similar minuteness they too reveal numerous such changes. The seeming contradiction involved in the assertion of the constancy of genes has, like most such contradictions, a historical origin. It used to be supposed that all or most of the excessively numerous diversities between adult organisms were due to variations (to changes) in the hereditary constitution. It turned out that this was not true, most of them being mere transitory environmental effects, or else permanent diversities between stocks. Hence the (at least relatively) stable genes were contrasted with these fluctuating adult traits; thus arose the dogma of the invariability of genes. But intensive study has shown that the genes do become altered in manifold ways. Some of the alterations are such as give marked changes in hereditary traits, as when the red eye of the fruit fly suddenly changes to white; these are the typical "mutations." Others have such slight effects as to be detectible only by the most refined methods; such minute heritable changes have been described in great number of late, particularly in *Drosophila*. Some of these ("modifying factors") have no observable effect save in the presence of some particular other mutated gene. Further, the same gene has been found to undergo many diverse hereditary changes, giving the so-called "multiple allelomorphs." Thus one of the genes for eye color in *Drosophila* is now known to exist in at least eight diverse conditions, and similar systems of "multiple allelomorphs" are becoming known in other organisms (for summary, see Morgan, *Sci. Monthly*, June, 1918). No further dispute is possible as to the alterability of genes; such controversy as persists is as to the nature of the changes that occur, and as to the relative frequency of such changes.

As to the nature of the changes that occur, the typical mutationist view is that these are always qualitative (involving chemical transformation), that is, essentially "discontinuous," no matter how slight the visible alteration that results. This is ably urged by Morgan (*Am. Nat.*, 1917, and *Sci. Monthly*, 1918), with whom many other investigators agree. The many cases in which the heritable changes result in purely quantitative alterations in adult characters, as in change of dimensions, greater or less extent or intensity of pigmentation, or the intersexual gradations described by Goldschmidt, are held to be the result of chemical alterations in the genes; as such they are separable in inheritance, on the Mendelian schema.

On the other hand, some investigators hold that purely quantitative changes in the gene—in the amount of substance present—are the basis for many heritable variations; this view is urged by Goldschmidt (*Am. Nat.*, 1918). It meets difficulties in the known capability of the substances in question to increase in quantity by assimilation, etc., in the single individual or cell, so that the exact amount present at the beginning of development might well make no difference in a later cell generation. It is accepted also by Castle (*Proc. Wash. Acad. Sci.*, 1917).

Naturally coupled with it is the conviction set forth by Castle and Goldschmidt and by Sumner (1918) that the genes are essentially plastic; that they may blend in inheritance, not later separating completely, as in the typical Mendelian schema. These latter views, however, are based on direct experimental results, and would be held even though the notion of variations in the amount of substance in the gene as a cause of inherited changes in traits should be proved untenable. The experimental evidence is of the following character. In some stocks, traits that behave as a single character in Mendelian experimentation are gradually modifiable from generation to generation by steady selection of quantitative differences. Castle (*Am. Nat.*, 1917) gives a summary of his extensive researches leading to this result in relation to the coat color of the rat; he argues that the observed results are due to numerous gradual alterations of a single gene. Many experiments on certain characters of *Drosophila* by McDowell, May, Marshall and Muller, Payne and others have shown the same effectiveness of selection; but most of these observers conclude that the changes are not the result of frequent alterations in a single gene, but, so far as they are not due to preexisting genetic diversities, are the consequence of rare alterations in diverse genes, some occurring in one individual, some in another—each modifying slightly the adult trait. The rapid effectiveness of selective breeding is held to be due to its collecting of these diverse "multiple modifying factors" into single individuals, which then show the cumulative effect of all of them. The evidence is strong that this is the correct explanation for many of the cases. Castle, however, holds that the evidence excludes it for the case of the rat; Sumner and Goldschmidt, on the basis of their own experiments, agree with Castle. Little (*ibid.*, 1917), on the other hand, sums up the evidence as decidedly favoring the multiple-factor hypothesis for the rat and other mammals.

Not susceptible of this explanation are the cases in which heritable variations are found to occur during vegetative reproduction, where there is no recombination and accumulation of genes. A case of this sort is added to those before known by Root for the rhizopod *Centropyxis* (*Genetics*, 1918); but inherited variation is here less marked than in *Difflugia*, before described by Jennings.

On the other hand, many "unit characters" do not become modified in consequence of selective breeding (for example, the case described by Roberts, *Jour. Exp. Zoöl.*, 1918). Further, in the vegetative reproduction of some organisms, inherited variations fail to appear and selection is quite powerless to change the stock. Ewing (*Trans. Ill. Acad. Sci.*, 1917) summarizes his long continued researches on this matter in respect to many characters in plant lice during parthenogenesis; inherited variations did not appear, and selection was totally ineffectual.

On the whole, the investigations of the past two years appear to confirm for most organisms the great infrequency of heritable changes as compared with non-heritable fluctuations; but they indicate that in some organisms heritable changes are more frequent.

Production of Heritable Variations by External Agents.—Further attempts have been made to alter the germ cells in such a way as to induce heritable results through the administration of drugs, by Pearl (*Jour. Exp. Zoöl.*, 1917), by Stockard and Papanicolau (*ibid.*, 1918), and by Hance (*Am. Nat.*, 1917). In Pearl's extensive experiments the effects of ethyl and methyl alcohol and of ether were tested on fowls. It was found that the number of offspring produced was decreased by the drugs, but those produced were not injured (they were indeed measurably superior to those from parents not subjected to the drug). There was no indication of any specific effect on the germ cells, much less of heritable alterations. Stockard and Papanicolau, on the other hand, confirm their previous reports of marked injuries to the germ cells produced in the guinea pig by the same drugs, resulting in abnormal and degenerate descendants for many generations (six) after that in which the drugs were administered. Yet no specific heritable characters were altered; so that there was no indication that the normal heritable differences between stocks are produced in this way. Hance attempted without result to produce heritable alterations in *Oenothera* by subjecting the seeds and seedlings to certain drugs.

Of a different type are experiments reported by Tower (*Biol. Bull.*, 1917). Stocks of the potato beetle which had been living at Chicago were transported to the hot, dry climate of Arizona and allowed to breed there. They develop during the first season a "capacity to hold on to the water content in their tissues," to resist desiccation, such that when returned to Chicago they can no longer rid themselves of water as required for winter hibernation, so that they perish in the northern winters. This tendency increases slowly after the first season in the hot climate. It is hereditary, behaving in inheritance as a Mendelian dominant. A definite adaptive heritable trait has been acquired as a result of a change in environment.

Method of Evolution.—The experimental studies of variation, just summarized, have formed, with the findings as to diversities of stocks in nature, as to geographical distribution and paleontological succession, the basis for many discussions of the method of evolution. Such have appeared in the *American Naturalist* (1917 and 1918) by Pearl, Longley, Jennings, A. F. Shull, the Hagedoorns, Osborn, Gates, Gregory, Goldschmidt, Babcock, East, Sumner; in the *Journal of the Washington Academy of Sciences* (1917) by Jennings and by Castle; in the *Scientific Monthly* (1918) by Morgan; in *Scientia* by Perrier; there are also incidental discussions in reports of concrete researches. Naturally, the diversities of view as to the nature of variation are reflected in the theories of the method of evolution.

The discovery that heritable variations in the genes ("mutations") are frequently as minute as can be detected has led to such a modification of the mutation theory as to leave it closely resembling the older Darwinian theory—that evolution is mainly based on minute heritable variations, with some assistance from sports. The later theory differs in the additional knowledge that the seat of these variations is in the chromosomal genes, and their inheritance is therefore Mendelian; and in recognizing more distinctly that most of the visible diversities between individuals are not examples of such heritable alterations. In the minds of some, further, the later theory perhaps still attributes a somewhat greater *rôle* to saltations. The view that evolution is due to such heritable changes in the genes, guided so far as the production of adaptive complexes is concerned, by natural selection, is adopted by most of the authors mentioned above, though with various modifications. The typical mutationist view is that succinctly stated by Shull, that the variations on which evolution is based are chemical alterations in the chromosomes (therefore "discontinuous"), and occurring with little relation to environmental conditions; it is supported by Morgan and seems to underlie many of the discussions. On the other hand, those who, like Goldschmidt, Castle, Sumner, believe in quantitative, continuous, blending variations, naturally hold that these play a large *rôle*, if not the chief *rôle*, in evolution. These authors, along with Gates, Gregory, Osborn, Jennings and others, emphasize the fact that the diversities between related stocks in nature, between geographical races, and between successive stocks in geological series, are of the sort that one would expect from finely graded or continuous variations rather than from saltations; while Morgan continues to emphasize primarily saltations, though admitting that the minute variations have played a part. From the facts just stated the conclusion has been drawn by some that there are two classes of variation—on the one hand, the typical discontinuous mutations, on the other, a class variously characterized as quantitative, as orthogenetic, as adaptive, as due to the stress of the environment; as non-Mendelian, etc. (Gates, Goldschmidt, Sumner, Gregory, Castle, etc.). The distinction into two classes is rejected by Babcock, Morgan, Jennings and others, who hold that the observed minute Mendelizing "mutations" form the basis for geographical races and the like. Osborn gives classifications of heritable variations from a number of points of view; in these he accepts most of the diverse classes distinguished by others.

Tower holds that direct accommodations to the environment, such as that reported by him in the potato beetle, becoming hereditary, play an important *rôle* in evolution. From a broad survey of the animal kingdom Perrier concludes that the inheritance of changes directly resulting from the diverse bodily positions taken by organisms has largely determined their characteristics. Redfield continues to argue for the inheritance of acquired functional power, though thus far without success in persuading professional biologists to take his analyses seriously (see *Eclectic Med. Jour.*, Nov., 1917). Babcock, Shull, and East express the opinion that no inheritance of the results of environmental action has yet been demonstrated. On the whole the problem of the inheritance of acquired characters has been in abeyance.

Based on their extensive studies on the races of rats, the Hagedoorns reject both mutations and environmental modifications as material for evolution. According to them, "the only cause of inheritable variability in multicellular organisms which can be of any account in evolution is mating between individuals of unequal genotype, crossing in the widest sense (amphimixis)." They hold that such crossing brings to light characters which have never appeared before, though "these were already given in the genotype of the species crossed." They show in detail how new recessive characters may be brought to light in this way, and assert that the same is true for dominant characters, though how this can occur is not evident and they do not undertake to explain it. The idea that some new characters (not mere recombinations) may be produced by crossing is accepted by many; it is expressed by Babcock and others. Babcock puts forward change in the number and grouping of chromosomes as an evolutionary change not included under other heads.

As to guidance of the process and products of evolution, most authors accept some form of natural selection as the method of origin of adaptive complexes. But all recognize the existence of many non-adaptive structures with whose production natural selection has had nothing to do (save that it has not destroyed them, while it has destroyed others). Among those who declare for guidance by natural selection are Longley, Jennings, Castle, the Hagedoorns, Gates, Goldschmidt, Babcock, East, Morgan. That the essential *rôle* of sexual reproduction is its presentation of a greatly increased variety of combinations to the selective process is urged by East. Natural selection is accepted with some qualification by some; the paleontologists, Osborn and Gregory, hold to a progressive adaptation (orthogenesis), of which the guidance by natural selection is not clear. Osborn and Goldschmidt renew the suggestion that this possibly results from natural selection through the occasional coincidence of spontaneous variation in the same direction as the adaptive modification due to the environment.

Castle holds that selection "may be the cause of further variation in the same direction and so an agency in the progressive evolution of a new type," and Goldschmidt that it can "change the quantity of the gene, and also therefore the somatic characters caused by quantitative differences in the genes." The ground for this is the view that the nature of the variations that may occur depends upon the nature of the surviving genes, so that different variations will occur after one type of gene has been selected, as compared with what would occur if another type had been selected; and the notion that by selecting individuals that have varied in a certain way, stock has been selected that tends to vary further in that particular way. Morgan, however, holds that study of the numerous mutations of *Drosophila* shows that when a character has mutated in a particular way, it has no tendency to mutate farther in one direction rather than another.

In contrast to those thus far named, Pearl reviews most unfavorably the evidence as to the part played by selection, particularly selection based on somatic characters, and with reference to the production of variation by selection. He elects for the view that

> selection . . . has nothing whatever to do with the causes of variation, and is wholly powerless unless (*a*) the basis of selection is directly gametic, by means of the progeny performance test, or (*b*) the somatically selected individuals happen by good fortune to carry the necessary hereditary determiners in the germ plasm.

The positive possibilities opened by the two provisos (*a*) and (*b*), particularly in view of the known fact that bodily characters are in many cases correlated with the nature of the germinal determiners borne, Pearl does not develop; to do this might lead to greater agreement with those who accept the guiding *rôle* of natural selection. Shull expresses the opinion that "survival is much less dependent upon fitness than has been supposed and that natural selection operates only to eliminate the most unfit." Perrier also minimizes the *rôle* of natural selection.

All together, in spite of diversities in detail, it would appear that the consensus of belief is that evolution is the result of the appearance of germinal variations, small or large, which are for the most part independent, so far as has been detected, of environmental conditions; that many of these result in structures that are neutral so far as adaptation is concerned, so that natural selection has had little to do with building them up; but that so far as adaptive complexes exist, their production has been guided by natural selection. The resulting theory appears to be close to that of Darwin, but not to that of Weismann.

Special Problems in Evolution.—Longley has published extensive studies on the *rôle* of coloration in organisms, with consequent development of a modified theory of mimicry and related phenomena (*Jour. Exp. Zoöl.*, 1917; *Am. Nat.*, 1917). He holds that the fundamental phenomenon is obliterative coloration (even in cases that have been considered conspicuous); from this the rest has developed through natural selection. The subject has been enlivened by a characteristically sharp criticism of Longley's work by the late Mr. Roosevelt (*Am. Museum Jour.*, 1918); he rejected Longley's hypothesis as a general theory.

Buchanan (*Am. Nat.*, 1918) presents an analysis of the probable phylogeny of the bacteria. Wheeler (*Proc. Am. Philos. Soc.*, 1918) gives a valuable discussion of the evolution of the social habit in insects, with particular relation to ants.

General Works. — Two general works on evolution have appeared. *Organic Evolution* by R. S. Lull (1917) is a systematic textbook treating the subject mainly from the point of view of the palæontologist. Its aim is expository, rather than the presentation of new points of view; this purpose it serves admirably.

The most notable single event touching evolution during the past two years is the appearance of H. F. Osborn's *The Origin and Evolution of Life* (1917). The work is one of original and ambitious aims, attempting to displace the basis of a treatment of biological evolution from matter and form to *energy*. Part I deals with "The Adaptation of Energy," chapters being devoted to "The Preparation of the Earth for Life"; "The Sun and the Physico-chemical Origins of Life"; "Energy Evolution of Bacteria, Algae and Plants." Here the discussions take a wide sweep and are necessarily preliminary, suggestive and general. Part II, comprising two-thirds of the book, deals with the concrete succession of forms in the evolution of the diverse classes of animals, particularly the vertebrates, together with the laws revealed in this succession. Here Osborn's special knowledge, and the unrivalled resources of the American Museum of Natural History in palæontological materials, restorations and illustrations, have combined to produce a treatment of extreme interest, from both the popular and the scientific point of view. The book will serve as a point of departure for much later discussion on evolution.

VERTEBRATE ZOÖLOGY

H. E. Jordan

Microscopic Anatomy.—F. P. Johnson (*Am. Jour. Anat.*, xxiii, 2) has made a valuable addition to our knowledge of the microscopic anatomy of the liver. Formalin-fixed blocks of hog's liver were macerated by treatment with a 50 per cent. HCl solution. The isolated lobules vary greatly in size and in shape, being from 0.5 mm. to 2.0 mm. in diameter, and of irregular polyhedral form with a varying number of sides, either plane, convex or concave. The surface lobules are in general more prismatic or pyramidal than the internal ones. The lobules of large livers are, on the whole, larger than those of smaller livers. Compound lobules also occur, the result of incompletely separating connective-tissue septa. The total average number of lobules in the pig's liver is given as 702,000.

R. Pearl and Alice M. Boring (*Jour. Exp. Zoöl.*, xxv, 1) present a study of eight hermaphroditic fowls. The specimens are said to be basally females with ovaries in various stages of embryonic arrest of development or degeneration, four having both ovarian and testicular tissues. The sex or degree of activity of the gonad seemed to have no direct causal relation to the development of comb, spurs or wattles. There was likewise no evidence that the interstitial cells were causally related to the secondary sex characters. The amount of lutear cells or pigment, however, was in precise correlation with the degree of external somatic femaleness exhibited by the individual. These same authors (*Am. Jour. Anat.*, xxiii, 1) describe also a structure in the ovary of the domestic fowl homologous with the corpus luteum of the mammalian ovary; it arises from the theca interna following discharge or degeneration of the ovarian follicle, and represents in its development an abbreviation of the corpus luteum of the mammal.

H. B. Ward has prepared for the *American Encyclopedia of Ophthalmology* (Vol. 12) a valuable illustrated article on "The Animal Parasites of the Human Eye, with Notes on Similar Organisms in Other Vertebrates." Reprints of this article of 90 pages are available for distribution in pamphlet form.

H. E. and K. D. Metcalf (*Anat. Rec.*, xiv, 1) contribute a brief description of a cat with a double inferior vena cava. They interpret the condition as due to the post-embryonic persistence of the right and left posterior cardinal and the left supracardinal veins.

In an attempt to settle the question regarding the presence of a renal portal system in reptiles, B. L. Robinson (*ibid.*) studied by means of injections of gelatin and starch masses the turtle *Chrysemys marginata.* Double injection of the kidney revealed a connection, larger than capillary, between the renal portal vein and the postcava; which result is believed to prove "at least that a complete renal portal system does not exist in this reptilian form."

G. M. Curtis (*Am. Jour. Anat.*, xxiv, 3) presents a study of the form of the seminiferous tubules in the mouse, rabbit, and dog. The simplest form of tubule, in the shape of an arch opening at both ends into the rete testis, may become linked with adjacent arches into complex groups. Linking is especially pronounced in the rabbit. Blind ends or nodular enlargements do not occur.

From observations on the erythroplastid in the wing of the living bat, L. B. Arey (*Anat. Rec.*, xiv, 1) contributes additional evidence in support of the prevalent belief that the normal shape of this blood corpuscle is not that of a cup, as recently claimed by some, but that of a circular biconcave disc.

By methods of vital staining by intraperitoneal and intravenous injections of trypan blue and lithium carmine, K. W. Dewey (*ibid.*, xv, 1) reveals a striking difference in behavior on the part of the endothelial cells lining the perivascular spaces of the brain and spinal cord, and similar spaces in the connective tissue of other organs and tissues. The former in rabbit, dog and cat do not habitually take up the vital stain, whereas the latter have a strong affinity for such stains.

H. E. Jordan (*ibid.*) has reinvestigated the histology of the lymph of the thoracic duct in the dog. He concludes that blood platelets do not occur in this lymph.

A. W. Meyer (*Am. Jour. Anat.*, xxiv, 1) records observations on giant-cells ("megacytes") in lymphatic tissue, including "hemal nodes." These cells are variously mono-, polymorpho-, or multi-nucleated. The latter are regarded as fusion products. Meyer inclines to belief in an exclusively stromal origin. The giant cells are more common in fetal nodes; they are apparently capable of slight ameboid activity and slight phagocytosis, but generally show evidences (nuclear and cytoplasmic) of degeneration. In continuation of an extensive series of studies on hemal nodes Meyer (*ibid.*) reports on conditions in the domestic pig. It must be recalled that Meyer interprets his earlier evidence as showing that there are no such structures as true hemolymph nodes, that is, lymphatic nodes with both lymph and blood sinuses; but only "lymph nodes" with lymph sinuses and a closed blood supply, and "hemal nodes" with blood sinuses but no lymph supply. According to his definition of hemal nodes, no such structures occur in the pig. Meyer approached the study of the reddened nodes of pig carcasses, previously described as hemolymph nodes, by the injection method. This shows that these nodes are interpolated in a lymph-vessel system and are therefore true lymph nodes. The question of the origin of the relatively large number of erythroplastids in the lymph sinuses and the efferent lymphatics, apparently formed within the lymph node, remains undecided.

H. E. Jordan (*ibid.*, 2) presents a study of the giant cells of the yolk sac and red bone marrow of the turtle and certain mammals. These tissues contain a homologous type of giant-cell, namely a hemogenic cell which arises from a hemoblast, becoming first a mononucleated megakaryocyte and subsequently either a polymorphokaryocyte or a polykaryocyte. This type of cell differentiates into erythrocytes in the yolk sac, and under certain conditions also in the red marrow. In both locations it may give origin incidentally also to blood platelets. The red marrow of young bones contains in addition also an osteolytic giant cell, or osteoclast, always multinucleated and originating from the marrow reticulum by a fusion of discrete elements, including osteoblasts. Osteoblasts do not contain the characteristic metachromatic granules after Wright's technic, and do not produce erythrocytes or blood platelets, but are true bone absorbers.

By the use of tissue-culture and vital-staining methods, S. Matsumoto (*Jour. Exp. Zoöl.*, xxvi, 3; xxvii, 1) has demonstrated the capacity for movement and phagocytosis of the corneal epithelium of the frog. The movement seems to be exclusively thigmotatic in nature.

H. E. Jordan (*Anat. Rec.*, xv, 1) gives a description of a cryptorchid pseudo-hermaphrodite. The interstitial cells of the hyalinized testes are greatly reduced in number and in size, in sharp contrast with the usual condition in undescended testes where the large interstitial cells are relatively increased in number. Correlated with the paucity of interstitial cells in the hermaphrodite was an absence of sexual desire, a fact in agreement with the hypothesis that "desire" results from an internal secretion on the part of the interstitial cells.

W. H. F. Addison and J. M. Thorington (*ibid.*, xiv, 7) report on the relative phagocytic capacity of the polymorphonuclear cells and the macrophages of the peritoneal fluid in the albino rat, towards particulate matter (carbon particles, lithium carmine, trypan blue, and other colloids). It is shown that the polymorphonuclears might phagotize sizes only within certain limits while the macrophages phagotize particles both larger and smaller than those taken up by the polymorphonuclears, results which indicate that the size of the particle is an important additional factor in determining the type of phagocytic response. The basophils and eosinophils did not phagotize any of the suspensions.

H. Downey (*ibid.*, xv, 3) concludes that phagocytosis of colloidal dyes by polymorphonuclears depends on the availability of the dye rather than upon any inherent physiologic difference with respect to phagocytosis between these cells and the mononuclear macrophages of the tissues. Eosinophils are said to be killed by trypan blue.

The experiments of C. F. W. McClure (*Am. Anat. Mem.*, No. 8), carried out to test the behavior of frog and toad larvae towards similar colloidal dyes, indicate that initiation of the processes of dye ingestion by various tissues is associated with the attainment of some definite stage of development, and that phagocytosis by macrophages is coincident with the establishment in the embryo of a continuous lymph flow through the lymphatics, between the tissue spaces and the veins.

O. Van der Stricht (Carnegie Inst. of Wash., *Contributions to Embryology*, No. 21) presents a study of the genesis and structure of the membrana tectoria and the crista spiralis of the cochlea in a number of mammals. He describes the membrana tectoria as a cuticular formation derived in part from the cytoplasm of a columnar epithelium and in part from the included intercellular terminal bars.

Cytology.— R. T. Hance (*Biol. Bull.*, xxxv, 1) records numerical variations in the somatic chromosomes of the domestic pig. The spermogonial chromosome number is uniformly 40, but in the somatic cells the number ranges from 40 to 58; the extra somatic chromosomes result from a fragmentation of the larger elements.

J. Y. Malone (*Trans. Am. Micr. Soc.*, xxxvii, 2) has investigated the spermogenesis of the dog. He records a dimorphism of sperms with 10 and 11 chromosomes respectively, the latter including a typical x-chromosome. In the albino rat E. Allen (*Jour. Morph.*, xxxi, 1) reports a similar dimorphism of sperm, with 18 and 19 chromosomes.

J. Duesberg (*Am. Jour. Anat.*, xxiii, 1) traces in detail the history of the mitochondria ("chondriosomes") during spermogenesis in the teleost fish Fundulus. His observations support his earlier claims regarding the continuity of the mitochondria throughout the spermogenic process. In a description of the cytology of the interstitial cells of the testis of the opossum, Duesberg (*Biol. Bull.*, xxxv, 3) pays special attention to the chondriosomes and the apparatus of Golgi.

G. N. Papanicolaou and C. R. Stockard (*Am. Jour. Anat.*, xxiv, 1) present a detailed study of the idiosome of the guinea pig. This body is shown to have a double nature, the development of the two constituents being independent of each other.

Embryology.—H. V. Neal (*Jour. Morph.*, xxx, 2) has published further evidence, from a study of the first three permanent myotomes of *Amphioxus*, *Petromyzon* and *Squalus*, in support of his earlier conclusion (1907), following that of Dohrn (1904), that the second as well as the third myotome participates in the formation of the external rectus muscle. He concludes finally that originally, that is, phylogenetically, the eye muscles were metameric diverticula of the invertebrate intestine.

A detailed study of the development of the notochord ("chorda dorsalis") in guinea-pig embryos from the tenth to the fifteenth day leads G. Carl Huber (*Anat. Rec.*, xiv, 4) to the conclusion that this structure in this form is a derivative of the ectoderm "in the sense that the mesoderm is derived from the ectoderm of the primitive streak region of the embryonic shield." In place of an open neurenteric canal the guinea pig embryo has an indefinite "neurenteric cord" passing from ectoderm to entoderm in the region of the primitive node.

I. E. Wallin (*ibid.*, 3) submits evidence from a study of the lamprey (*Ammocetes*) larva which he interprets as showing a mingling of entoderm and mesenchyma throughout the general branchial epithelium, in the manner of the histogenetic process prevailing in the development of the thymus gland of higher vertebrates. Only a small portion of this composite tissue, however, enters into thymus formation in the lamprey; the cells of the greater portion of this mixed tissue are said to become transformed into lymphocytes.

E. A. Boyden (*Am. Jour. Anat.*, xxiii, 1) reports vestigial gill filaments in the chick embryo, thus completing the data establishing a series of gill-bearing vertebrates from fishes to mammals.

F. W. Stewart (*ibid.*, xxiv, 2) has added to our knowledge of the development of the thymus by a study of the fate of the ventral diverticula of the fourth and fifth pharyngeal pouches in the cat, the "thymus IV" and the ultimobranchial body. Both are essentially rudimentary thymic anlages of variable and transient occurrence contributing only to the development of the internal thymic lobule, the definitive thymus having origin almost exclusively from the diverticula of the third pouches. He concludes further that the thymic (Hassall's) corpuscles are derived from the epithelial stroma of the gland, and are to be regarded as regressive structures. In the pig, the ultimobranchial bodies, of variable size, shape, location and degree of transformation, participate to a small extent in the formation of the thyroid follicles (J. A. Badertscher, *ibid.*, xxiii, 1). In the grouper (C. E. Johnson, *Jour. Morph.*, xxxi, 1) these bodies make only a transient early appearance; in this form the "thymus IV," however, fuses with the thymic anlage of the third pharyngeal pouch at the ninth day and contributes to the constituents of the definitive gland. F. M. Baldwin (*ibid.*, xxx, 2) presents a study of the pharyngeal derivatives of *Amblystoma.* C. E. Johnson (*ibid.*, xxxi, 1) presents a similar study of the pied-billed grebe. E. H. Norris (*ibid.*) traces in detail the morphogenesis of the thyroid gland in the dog-fish *Squalus acanthias.* Ruth Rand (*Anat. Rec.*, xiii, 7) describes the development of the pharyngeal tonsil in the pig embryo; it is said to arise in close connection with a series of pharyngeal pockets corresponding to the bursa pharyngea of man. W. J. Atwell (*Am. Jour. Anat.*, xxiv, 3) describes the development of the hypophysis cerebri of the rabbit.

The question of blood-cell origin, whether by the monophyletic or the polyphyletic mode, continues to receive merited attention. Recent attack has been largely by experimental methods. Vera Danthakoff (*ibid.*, 1) has continued her studies along this line by grafting particles of adult spleen on the allantois of chick embryos. Under these experimental conditions the allantoic mesenchyme becomes edematous and the walls of its blood vessels dissolve, permitting thus the escape of their contained erythroblasts. Originally intravascular hemoblasts when thus transferred extravascularly develop only into erythrocytes. The hemoblast during its residence within blood channels received an irreversible bias toward erythrocyte development. She concludes that the differential factors in the development of the polyvalent hemoblast are extrinsic, and, in the erythroblastic differentiation of a hemoblast, consist in the conditions present within the vessels. In an extension and further analysis of these experiments (*ibid.*, 2) she obtained results which demonstrate that the allantoic mesenchyme and endothelium, under stimulation of spleen grafts, are potential hemopoietic anlages. Additional evidence in favor of the monophyletic theory of blood-cell origin accrues from her demonstration that an endothelial cell of the graft may separate peripherally from the blood-vessel wall and become reincorporated with the mesenchyme to develop later into a granuloblast, instead of into an erythroblast as it does when separating intravascularly. A similar polyvalency characterizes both mesenchyme and endothelium and brings these two tissues as regards capacities of differentiation very close together.

H. E. Jordan (*Anat. Rec.*, xiv, 7) gives a description of a 7-mm. human embryo characterized specifically by being twisted through one complete spiral and by containing exceptionally large aortic cell clusters. The twisted condition is interpreted as the necessary mechanical consequence of an attempt on the part of the embryo to accommodate its lengthening form to a restricted attachment to the chorion by an abnormally short body stalk. The latter condition involved an early destruction of the yolk sac through premature fusion of the amnion and chorion. The aortic cell clusters arise from the endothelium, function as blood islands, and may signify a compensatory hemopoiesis in lieu of the disintegrated yolk sac.

F. P. Mall (*Am. Jour. Anat.*, xxiii, 2) has analyzed the data in the records of the Carnegie Embryological Collection and those in various recent publications with a view to determining the time relation between the menstrual age, copulation age, ovulation age and fertilization age of human embryos. He concludes that the copulation age, which shows a mean of ten days less than the menstrual age, is probably very nearly the true or fertilization age. N. W. Ingalls (Carnegie Inst., *Contributions to Embryology*, No. 23) has published a description of a human embryo of approximately 18 days.

E. R. Clark (*Am. Jour. Anat.*, xxiii, 1) reports on a study of the blood vessels in the tail of living frog larvae, planned with a view to determining the factors which regulate their growth. He concludes that

> while blood-vascular endothelium differentiates, develops the power to grow by sprouting, and forms a primitive system of arteries, veins and capillaries as the result of hereditary factors, it very early becomes dependent, for its complete and orderly working out into the elaborate and beautifully proportioned adult vascular system, upon the regulative action of outside factors, to which it reacts in definite ways and upon which it comes to be completely dependent.

W. B. Chapman's observations (*ibid.*) on cardioectomized chick embryos support the same general conclusion.

J. R. Cash (*Anat. Rec.*, xiii, 7) traces the cardiac lymphatics in a series of pig embryos to two sources, the right lymphatic duct and the tracheal plexus. A pericardial plexus covering the entire heart attains its greatest density at the 60-mm. stage, and the myocardium is invaded by lymphatic sprouts from this plexus at the 150-mm. stage of development.

T. Kudo (*Jour. Comp. Neur.*, xxix, 3) describes the development of the "macula neglecta" Retzii of the utriculus in the ear of the snake, *Trigonocephalus japonicus*, as arising from the epithelium of the pars inferior, or sacculus.

In a study of the weight of the epididymis, pancreas, stomach and submaxillary glands in the albino rat, before and after puberty, in both sexes, S. Hatai (*Am. Jour. Anat.*, xxiv, 1) has discovered the interesting fact that the pancreas shows a distinct sex difference in respect of weight, the female sex having a heavier pancreas than the male of the same body weight, the difference appearing as early as the stage of 20 grams body weight. This agrees with Welcker's earlier data which showed a similar sex difference in other mammals and several lower vertebrates.

O. Lloyd-Jones and F. A. Hays (*Jour. Exp. Zoöl.*, xxv, 2) studied the influence of excessive sexual activity of male rabbits on (1) the nature of the seminal discharges and (2) the nature of their offspring. They record a marked and regular decline in percentage of induced pregnancies as the number of preliminary copulations increased; no increased mortality or inferiority of offspring in advanced service groups was observed; heavy sexual service of the male appears to increase the percentage of females among the offspring, and their early mortality.

Neurology.—In continuation of his investigations concerning the metabolic activity of the nervous system of vertebrates, S. Hatai (*Jour. Comp. Neur.*, xxix, 1) follows his study of the non-protein nitrogen in the central nervous system of the albino rat (*A. Y. B.*, 1917, p. 644) with a similar study of the brain of the gray snapper (*Neomaenis griseus*). The non-protein nitrogen is found to be considerably greater in the fish brain than in the rat brain, but, as in the rat brain, the greater fraction of this non-protein nitrogen is represented by the amino-acid nitrogen. The amounts of urea nitrogen and of ammonia nitrogen are also closely similar to those found in the rat brain. He records further that beginning with the 150-mm. stage, the brain weight increases as the body weight, and that the myelination is completed relatively earlier in the fish brain than in the mammalian brain.

S. W. Ranson and P. R. Billingsley (*ibid.*, 4) present a series of six studies on the autonomic nervous system. In the introductory article Ranson suggests the adoption of a uniform terminology to meet the demands of both anatomists and physiologists. The modifications proposed would seem to be met by adoption of the terminology employed by Langley, with omission of the word "enteric" used to designate the submucous and myenteric plexuses of the digestive system as a subdivision of the autonomic system distinct from the thoracicolumbar, sacral and cranial subdivisions. Three studies are devoted in part to the intimate structure of the superior cervical ganglion. The number of nerve cells in this ganglion in the cat is given as approximately 123,603, the number of ascending preganglionic fibers as 3,851. The ratio of 1:32 between these fibers and the cells of the ganglion is interpreted in terms of an approximate numerical ratio between the pre- and post-ganglionic neurons for this portion of the autonomic nervous system. Neither commissural nor sensory-motor synapses occur in the ganglion. Its preganglionic fibers from the cervical sympathetic trunk are composed of ascending myelinated fibers, all of which terminate within the ganglion either upon or within the cell capsule. None of its numerous branches contains sensory myelinated fibers from cerebral or spinal nerves. Two papers are devoted to the composition of the greater splanchnic nerves in the cat. This nerve comprises myelinated preganglionic fibers terminating in the celiac ganglion, and of both myelinated and non-myelinated afferent fibers, with occasionally a bundle of unmyelinated post-ganglionic fibers having origin from neurons in ganglia of the sympathetic trunk. An analysis of this nerve by means of degeneration experiments shows that, exclusive of the bundle of post-ganglionic fibers present in about 25 per cent. of the specimens, the fibers are derived from white rami. The nonmyelinated fibers are sensory and take origin in the spinal ganglia.

The results of a histologic study of the sensory root of the trigeminal nerve of the rat by L. A. Hoag (*Anat. Rec.*, xiv, 2) have supplied the explanation for the difference between central and peripheral myelinated nerve fibers as regards the absence of a neurolemma on the central fibers; the neurolemma sheath-cells accompanying the embryonic ingrowing processes of the neural-crest neuroblasts are prevented from entering the neural tube by the interposition of the developing pia mater and the external limiting membrane.

D. H. Dolley (*Jour. Comp. Neur.*, xxviii, 3) reports on a series of experiments designed primarily to disclose the nucleo-cytoplasmic changes following functional depression in the Purkinje nerve cell. He concludes that the reason why the nerve cell remains unimpaired through long years of life is that the specific products of its differentiation are entirely consumed in the functional reaction and the by-product eliminated. Pigmentation is claimed to be a phenomenon of chronic depression, the pigment arising from nuclear materials, both nucleoplasm and chromidial apparatus.

N. Sugita (*ibid.*, xxix, 1, 2, 3) presents a series (III to VIII) of comparative studies on the growth of the cerebral cortex in mammals. His work is based almost exclusively on material from the Norway and the albino rat. In a unit volume the number of cells in the cerebral cortex of the Norway rat is less than in that of the albino, but the total number of cortical cells is the same in both (the Norway cerebrum has a volume about 21 per cent. above that of the albino of the same age). The number of cells increases rapidly during the first 10 days, more slowly thereafter, and becomes complete at 20 days. At maturity the number of cells is twice that at birth. In albino rats starved throughout the suckling period, the brain weight was found to be eight per cent. below the normal of like age but 24 per cent. higher than in the normal of like body weight; correlated with this condition is a retardation of the myelination in the starved individuals. The cortical nerve cells in the cerebrum and in the cerebellum of the albino rat attain almost full size at 20 days, the weaning time. As in mammals generally, the cortical thickness diminishes from the frontal to the occipital pole and from the dorsal to the ventral aspect.

S. E. Johnson (*ibid.*, 4) publishes evidence from a series of experiments on frogs which appears to show that commissural neurons do not occur in the autonomic ganglia of this form. In the frog the autonomic cells are unipolar; the presence of dendrons, therefore, does not confuse the histologic pictures. After destruction of the spinal cord and section of the autonomic trunks, the spiral and pericellular network in the more caudal autonomic ganglia disappeared, and no other type of nerve endings could be found. The nerve terminations of the autonomic ganglia in the frog accordingly are most probably exclusively of cerebro-spinal origin.

J. M. A. Galvao (*Anat. Rec.*, xiii, 7) describes the finer structure of the ciliary ganglion of various species of Brazilian snakes. The neurons are typically unipolar, and are enclosed by a thin capsule.

F. W. Carpenter (*Jour. Comp. Neur.*, xxix, 5) describes nerve terminations, in the form of varicosed skeins and nets, in the longitudinal muscle coat of the cardiac end of the stomach of the cat. Similar endings, in the form of tufts of delicate fibrils, are described for the longitudinal muscle of the small intestine of the dog. The latter endings terminate fine non-medullated fibers from the myenteric plexus. The several endings are thought to conform more closely to the sensory than to the motor type of nerve terminations.

Experimental Zoölogy.—Results of experiments with the de-eyed hamlet demonstrate, according to W. J. Crozier (*ibid.*, 2), that the generally distributed "common chemical" sensitivity of this fish does not involve tactile receptors.

W. W. Swingle's experiments with frog larvae (*Jour. Exp. Zoöl.*, xxiv, 3) show that total starvation inhibits indefinitely their growth and metamorphosis, and prevents the development of the germ glands and sexual differentiation. Appropriate thyroid feeding (*ibid.*) caused abbreviation of the usual period of complete metamorphosis in *Rana catesbiana* from two seasons to a period of less than three weeks, but the germ glands and cells remained unaffected. Extirpation of the thyroid gland in *Rana pipiens* (G. S. Terry, *ibid.*,) produces a striking retardation of ossification and growth of the hind-limb bones. The results of B. M. Allen's similar experiments (*ibid.*) show that inhibition of ossification in one aspect of the general cessation of differentiation of the soma, after the period when the hind limbs have begun to grow, in thyroidectomized frog larvae. This inhibition affects general body form, the alimentary tract and the brain. Thyroid administration causes resumption of development even four months after it had ceased, except with respect to the germ glands. The general effect of extirpation of the thyroid does not inhibit the development of the pituitary and thymus glands (J. B. Rogers, *ibid.*). Inanition of young rats produces no marked change in the weights of the thyroid and pineal glands, but the lungs and thymus decrease considerably (C. A. Stewart, *ibid.*, xxv, 2).

The feeding of small quantities of Sudan III mixed in olive oil to albino rats from 27 to 33 days old produces a retardation of the normal rate of body growth, most marked in the case of the thymus gland (S. Hatai, *ibid.*, xxvi, 1). Thymus feeding, according to E. Uhlenhuth (*ibid.*, xxv, 1), has no specific effect, contrary to Gudernatsch's findings, upon development, metamorphosis and growth in the frog, but the resulting acceleration of growth and retardation of differentiation are due to "quantitative conditions," that is, a relatively increased and more nutritious diet.

R. G. Harrison (*ibid.*, 2) has published the results of an extensive series of experiments on the development of the fore-limb of Amblystoma. There is no distinct correlation between the part of the limb bud removed and any particular defect. Splitting of the limb bud does not result in reduplication. Properly oriented super-imposed buds will fuse and develop into a single normal limb. Transplanted limb-bud mesoderm may develop into a limb. Harrison concludes that the mesoderm of the limb bud constitutes a specific, self-differentiating, equipotential system. S. R. Detwiler's similar experiments (*ibid.*) with respect to the shoulder girdle show, however, that the rudiments of this element, in contrast with that of the limb, constitute a mosaic.

C. V. Morrill (*ibid.*, 1) records the striking result from his experiments on regeneration in the salamander, that when the entire fibula is removed from the leg, it is not replaced either by proliferation from its fellow or from the skeletal elements lying proximal or distal to it, even when one of the latter is injured.

INVERTEBRATE ZOÖLOGY

R. W. Hegner

General.—During the year 1918 it has been impossible for American students of invertebrate zoölogy to send the results of their work to foreign journals for publication, and hence practically everything that has appeared has been published in American periodicals or in book form. The most important of the periodicals are the *Journal of Morphology*, *Journal of Experimental Zoölogy*, *Biological Bulletin*, *Journal of Parasitology*, and the reports of various societies and state and Federal departments.

Ward and Whipple's book on *Fresh Water Biology*, which was in preparation for a number of years, was finally issued during the year. It will be of great usefulness to all those who are interested in the animals that live in fresh water and in methods of studying them. Most of the 1,111 pages are given over to invertebrates, and each large group has a chapter devoted to it, written by a specialist of the group. After a general statement regarding the morphology, physiology, habitat and methods of study, a key for the identification of the principal members of each group is given, accompanied by helpful illustrations, of which there are 1,547 in the book. There are also several chapters of a general nature, such as "Conditions of Existence" and "Methods of Collecting and Photographing."

Protozoa.—The protozoa continue to furnish many problems for investigation. Schaeffer (*Trans. Am. Mic. Soc.*, xxxvii, 79) has been able to distinguish clearly several species of Amoebae by their cytoplasmic structures and activities, and has described one new species of Amoeba, *A. bigemma*, and two new species of Pelomyxa, *P. lentissima* and *P. schiedti.*

A new diatom-eating flagellate has also been described by Schaeffer (*ibid.*, 177) with the generic name *Jenningsia* and the specific name *diatomophaga.* It is a very large species, averaging 180 microns in length, although several were found which measured 260 microns. The body is cylindrical with a flagellum about 150 microns long. In general appearance it resembles Peranema. Longitudinal fission was observed. Living diatoms are used as food and nutrition is completely holozoic. The genus Peridinium has furnished Barrows (*Univ. Cal. Publ. in Zoöl.*, xviii, 397) with material for an interesting study of the skeletal variations of the dinoflagellates. Yocom (*ibid.*, 338) has described a remarkable neuromotor apparatus in the hypotrichous ciliate, *Euplotes patella.* He finds a structure composed of a motorium, which is a center of coördination as proved by experiments, to which are joined five fibers from the five anal cirri and a fiber which connects with the inner ends of the cytostomal membranelles, and a lattice-work structure in the anterior lip which connects with the fiber around the anterior end. This system probably has a nervous function. When binary division occurs, a new neuromotor apparatus is formed by a differentiation of the ectoplasm of the posterior daughter cell. As Yocom remarks: "The more we learn about the protozoa, the more complex they become." In a second paper by Young (*Biol. Bull.*, xxxv, 38), on the relation of rhythms and endomixis in *Paramecium aurelia,* the available data on this subject are critically examined and the conclusion is reached that the process of endomixis does not have a fixed time periodicity but may be modified by the environment just as are other physiological processes. Parasitic protozoa form the material for investigations by Boyd (*Jour. Parasitol.*, iv, 168) and Kudo (*ibid.*, 141). Boyd has been successful in cultivating an intestinal flagellate of man, *Trichomonas intestinalis,* in unsterilized fecal suspensions in saline. The perfection of this method may lead to a more complete knowledge of the life history of this parasite. Kudo's studies of the extrusion of polar filaments of cnidosporidian spores show that they are extruded most perfectly when subjected to a concentrated solution of hydrogen peroxide.

Cœlenterata. — Investigations have been carried on with several species of cœlenterates. Walton (*Jour. Morph.*, xxxi, 43) finds that *Actinia bermudensis* may divide by longitudinal fission as a normal method of reproduction, although the possibility is not entirely excluded that this process may have been due to an injury or to the double condition of the embryo. Four free-swimming species of Hydromedusae furnished Child (*Biol. Bull.*, xxxiv, 49) with material for a continuation of his studies on physiological senescence. His results indicate that such a process occurs in these animals as evidenced by a decrease in pulsation rate and in susceptibility to various chemicals as development advanced, and that a decrease in the rate of metabolism is a characteristic feature of this process of senescence. Opposed to Child's previous work on axial gradients in Tubularia are the results of Garcia-Banus' researches on the same subject (*Jour. Exp. Zoöl.*, xxvi, 265). The latter claims (p. 273) that: "There is no evidence of the existence of level or regional differences of the rate of regeneration in the stem of Tubularia, and as a consequence there is no basis for the theory of axial gradient in this species."

Worms. — Publications have appeared during 1918 on both free-living and parasitic worms. The eye of the rhabdocoele, *Polycystis goettei,* according to Kepner and Lawrence (*Jour. Morph.*, xxx, 465) consists of two visual cells and one accessory, pigmented cell. The latter is spheroidal and has two lumina within it into each of which enters a retinula. This retinula has a region which is analogous and probably homologous with the ellipsoid of the vertebrate retinula. Another rhabdocole, *Prorhynchus applanatus*, was studied by Kepner and Scott (*ibid.*, 475) with reference to the cushion cells of the pharynx. These cells are situated at the base of the pharynx and possess the curious function of protecting the adjacent organs from the recoil of the pharynx. The study of polarity in the fresh-water flatworm, *Planaria maculata,* was undertaken by Olmstead (*Jour. Exp. Zoöl.*, xxv, 157). by means of regeneration experiments on triangular pieces. The conclusion was reached that polarity was not changed even in the most extreme cases of injury.

In two papers Bovard (*Univ. Cal., Publ. in Zoöl.*, xviii, 103) contributes to our knowledge of the function of the giant fibers in earthworms, and of the transmission of nervous impulses in relation to locomotion in these animals. Eggs of the marine annelid, *Chaetopterus,* when subjected to the rays of radium by Packard (*Biol. Bull.*, xxxiv, 50) exhibited abnormalities among the chromosomes. Those chromosomes that suffered the greatest injury were not connected with spindle fibers, which suggests that normal chromosomes are necessary for the formation of these fibers.

Parasitic worms and their histories are of great interest to many investigators. Van Cleave (*Trans. Am. Mic. Soc.*, xxxvii, 19) gives a key to all described species of Acanthocephala from North American birds, compares the acanthocephalan infestation in the families and orders of birds of central Europe and of North America, and describes several new species. Eight new species of cercariae have been described by Faust (*Jour. Parasitol.*, iv., 93) from the snails of Illinois. Southwell and Prashad (*ibid.*, 122) summarize the known methods of asexual and parthenogenetic reproduction in cestodes. These include internal proliferation from the walls of the cysticercoid, endogenous budding, external budding, and parthenogenetic reproduction.

The excretory system of *Agamodistomum* is described by Cort (*ibid.*, 130). It is very complicated and contains 60 flame cells.

Nematoda.—Reproduction in certain parthenogenetic and bisexual nematodes reared in artificial media forms the subject of a paper by Welch and Wehrle (*Trans. Am. Mic. Soc.*, xxxvii, 142). The artificial media mostly used consisted of a very dilute solution of peptone, diluted yolk of hen's egg, and Pfeffer's synthetic agar. The optimum temperature for rearing the nematodes was from 65°-75° F. In *Cephalobus dubius* reproduction seemed to be entirely parthenogenetic, no males being found. The period from one generation to the next was from 11-19 days. *Diplogaster œrivora* is bisexual but more females than males were observed. The females are both oviparous and viviparous. The length of life under cultural conditions averaged about 18 days, and the period between generations was from 4.5-5 days.

Mollusca. — Self-fertilization has been shown by Colton to be possible in the common pond snail, *Lymnaea columella,* and the same investigator (*Biol. Bull.*, xxxv, 48) now seems to have demonstrated this process in four other species of Lymnaea and in species of Physa, Planorbis, and Ancylus. The young snails, when a day or two old, were isolated, and when they had reached the adult stage, they laid fertile eggs. That this is not due to parthenogenesis seems probable from the facts that the snails are hermaphroditic, that self-copulation has been observed, that two polar bodies are produced by the egg, and that normal parthenogenesis is unknown among the Mollusca. One of the structures of lamellibranch mollusks the function of which is still problematical is the crystalline style which lies within the digestive tract. This organ has been studied thoroughly by Nelson (*Jour. Morph.*, xxxi, 53), who shows that it arises as a thin core of bubbly mucus, upon which are deposited coaxial layers of a gelatinous protein, containing enzymes. The style aids in separating the food from foreign particles. It contains strong amylolytic ferments, which are especially abundant in boring species.

Insects.—Of the many devices for obtaining oxygen found among the aquatic insects, the rectal gills of dragonfly nymphs are particularly interesting. Rich (*ibid.*, 317) has studied the gill chamber of many species. He finds six longitudinal rows of regularly arranged respiratory structures in all nymphs. The distribution of the gills varies in the different species as also does the distribution of the tracheæ. These are both described for a number of species.

Cytology and Embryology.—Several important papers dealing with the cellular structure, reproductive cells and embryology of invertebrates have appeared during the past year. Shull (*ibid.*, xxx, 455) finds that, contrary to general belief, the number of cells contained in the organs of the rotifer, *Hydatina senta*, is not constant, but in the gastric glands and yolk glands a variation of four per cent. and 7.5 per cent. was found. Nevertheless the percentage of cell constancy is remarkably high. In the same species of rotifer and in ten other species, Whitney (*Biol. Bull.*, xxxiv, 325) has discovered two types of spermatozoa, normal active spermatozoa with large heads, and degenerate immotile spermatozoa with small heads. The spermatogenesis of the edible crab of the Pacific coast, *Cancer magister*, has been worked out by Fasten (*ibid.*, 277). The germ cells of the cœlenterate, *Eudendrium*, according to Hargitt (*Jour. Morph.*, xxxi, 1), do not arise from a distinct germinal tissue as Weismann and others have supposed, but originate in the ectoderm. The manner, place, and time of their formation seem to have no apparent phylogenetic significance. Walton (*ibid.*, xxx, 527) has followed the history of the development of the nuclear and cytoplasmic elements of the egg, the process of fertilization, and the early stages of segmentation in the nematode of the dog, *Ascaris canis*. He finds the diploid number of chromosomes to be 36, and a heterochromosome group in the male consisting of 12 tetrad chromosomes. On fertilization a male zygote results from the union of an egg with a sperm containing 18 dyads, and a female zygote from the union of an egg with a sperm containing 12 dyads. During cleavage four of the five first soma cells undergo "diminution," and the descendants of the sixth generation of the stem-cell series are reproductive cells. The question whether amitosis occurs in the parents of functional germ cells is discussed by Nakahara (*ibid.*, 483). This investigator, from his studies of amitosis in the adipose cells of insects, concludes that in these cells amitosis is not a method of cell multiplication nor a sign of degeneration or senescence, but indicates an intense activity in the vegetative functions of the cell.

Invertebrate Morphology.—It is evident from the above brief statements of results that so far as invertebrate morphology is concerned, investigations do not center about any well defined hypotheses as has been the case in the past with respect to such theories as that of the germ layers or of metamerism. The subjects selected for investigation have no very clear relation to one another, but have apparently been chosen because suitable material happened to be available. Thus we find several contributions dealing with each of the large groups of invertebrates, but entirely unconnected in subject matter and method of treatment. In other words, invertebrate morphology is no longer a well organized branch of zoölogy.

BOTANY

B. M. Duggar

General.—War emergencies have in no wise checked the progress of botanical development and research. The National Research Council, acting as a Department of Science and Research of the Council of National Defense, appointed a Committee on Botany and a Raw Products Committee, to whom were referred emergency matters pertaining to the war. These Committees have stimulated research in directions which seemed applicable to the various war activities and they have served likewise as important clearing houses of information concerning botanical materials. The Research Council is also expected to undertake problems arising out of the war, and it is believed that the Botanical Committee will now give its attention primarily to the development of botanical research.

As a result of conferences and action growing out of the various botanical meetings at Pittsburgh in late December, 1917, plans were laid for the establishment of a new abstract journal in botany, to be known as *Botanical Abstracts*, the prime purpose of which is to supply citations and abstracts of all papers dealing with botanical subjects, wherever published, just as soon as possible after they appear. The first number was distributed in September, and the journal promises to be one of the greatest factors yet brought to bear upon the development of American botany. The control is in the hands of a board representing at present 14 American botanical organizations.

There has been established also during the year the *Journal of General Physiology*, edited by Jacques Loeb and W. J. V. Osterhout, the initial number of which appeared in September, containing articles on both the plant and the animal side.

Morphology.—The morphology of *Thraustotheca*, a water mould, has been investigated by Weston (*Ann. Bot.*, xxxii, 155), who concludes, after detailed studies upon development and reproductive relations, that its affinities are rather with *Achlya* than with *Dictyuchus*. Studying sexuality in *Rhizina undulata*, Fitzpatrick (*Bot. Gaz.*, lxv, 201) finds that while the cells of the latter become continuous, no nuclear fusions occur in the archicarps. Paired nuclei occur in the ascogenous hyphae (arising from the middle cells of the archicarp), but without conjugate divisions. Fusion of the pair of nuclei entering the young ascus occurs, and the author holds that double nuclear fusion in the *Ascomycetes* has not been demonstrated. Sax (*Am. Jour. Bot.*, v, 61) reports that spore formation in the 128-spored ascus of *Philocopra coeruleotecta* is fundamentally the same as in an eight-spored ascus. Convincing evidence is given by Douglas (*ibid.*, 36) to the effect that in exogenous agarics the method of origin of the gills is the same as in the endogenous forms previously studied by Atkinson except that such structures arise on an exposed surface and not within a gill cavity.

One of the most complete discussions of the problems of organization and inheritance in coenobic algae is contributed by Harper (*Proc. Am. Philos. Soc.*, lvii, 375) for the genus *Pediastrum*. In the morphology of the bryophytes and pteridophytes Cribbs (*Bot. Gaz.*, lxv, 91) describes a columella in the common *Marchantia polymorpha;* Stokey (*ibid.*, 97) reports a first case of apogamy in the Cyathaceae, and Steil (*Bull. Torrey Bot. Club*, xlv, 93) demonstrates the frequent occurrence of this phenomenon in *Pellaea*, *Pteris*, and *Aspidium*. Evans (*ibid.*, 205) has made detailed studies of the nature and characteristics of the air chambers in the liverwort *Grimaldia fragrans*.

Thompson (*Bot. Gaz.*, lxv, 83) shows that the highest type of vessel characteristic of the higher plants has arisen in different ways in the Gnetales and in the angiosperms. Studying the leaf cells of several genera of angiosperms, Tenopyr (*Bull. Torrey Bot. Club*, xliv, 51) shows that the cell shape is a hereditary factor which is fairly constant and is independent of the size or shape of the leaf. The mechanism of foliar abscission is described by Hodgson (*Univ. of Cal. Publ. Bot.*, vi, 417). In the study of the anatomy of certain goldenrods Whitaker (*Bot. Gaz.*, lxv, 250) contributes information of value as regards the origin of the stele in herbaceous types. Bailey and Tupper (*Am. Acad. Arts and Sci.*, liv, 149) have carefully and successfully blocked out the size variations in tracheary cells, involving a comparison between secondary xylems of vascular cryptogams, gymnosperms, and angiosperms. Coutant (*Bull. Torrey Bot. Club*, xlv, 353) has developed several new histological and developmental facts in studying wound cork in certain cacti. Langdon (*Bot. Gaz.*, lxv, 313) finds that condition and vigor of growth rather than age or location in the tree produce an effect upon the ray system of the oak.

Taxonomy. — Clayton's herbarium, now incorporated in the collections of the British Museum, was the basis for the description of a large number of American plants published in the *Species Plantarum*. Blake (*Rhodora*, xx, 21, 48, 65) has studied these plants and presents many notes of interest. Arthur and Risby (*Proc. Am. Philos. Soc.*, xvii, 173) have prepared a translation with extensive annotations of those parts of Schweinitz's two papers discussing North American rusts. Twenty-three new species of rust fungi from North America, chiefly Mexico, are described by Arthur (*Bull. Torrey Bot. Club*, xlv, 141), and he also (*Bot. Gaz.*, xlv, 460) describes 25 species from the Andes Mountains, while Jackson (*ibid.*, lxv, 289) discusses rusts of the tribe *Vernoniae* upon which hosts are included of 29 species, 25 occurring on the genus *Vernonia.* A well illustrated book on *Lactarias of North Carolina* by Coker (*Jour. Elisha Mitchell Soc.*, xxxiv, 1) includes 50 species, while a small handbook by McDougall (*Bull. Ill. State Lab. Nat. Hist.*, xi, 412) gives a general illustrated account of some edible and poisonous fungi. Boughton (*Rochester Acad. Sci.*, vi, 101) lists the Hymenomycetes collected in the vicinity of Rochester, and similarly Graff makes additions to Philippine Basidiomycetes (*Bull. Torrey Bot. Club*, xlv, 451). Burt (*Mo. Bot. Gard., Ann.*, v, 177) continues his monograph of North American Thelephoraceae; and Zeller and Dodge (*ibid.*, 1, 133) have treated fully American species of *Rhizopogon* and *Gautieria.* Adding to the described species of Laboulbeniaceae, Thaxter (*Proc. Am. Acad. Arts and Sci.*, liv, 207) reports 24 new species and one new genus from Chile and New Zealand.

Thirteen new species of Myxophyceae are described from the Pacific Coast by Gardner (*Univ. of Cal. Publ. Bot.*, vi, 249), continuing his work on the marine algae of the region. In an account of the algae of the Hawaiian archipelago MacChaughey (*Bot. Gaz.*, lxv, 42) emphasizes habitat relations and gives lists of species collected.

Very considerable activity has been manifested in the taxonomy of the higher plants, although no extensive manuals have appeared during the year. The nature of the work being accomplished is well shown by the following references. After describing 39 new species and many varieties of tropical Eupatorieae, Robinson (*Proc. Am. Acad. Arts and Sci.*, liv, 235) revises the Colombian forms and assembles the species of Venezuela and Ecuador. The helianthoid genus *Viguiera* has been revised by Blake (*Contr. Gray Herb.*, liv, 205) after a study of diverse material; diagnoses of 143 species are given, and nearly half the names are new. Likewise he (*ibid.*, liii, 23, 30) describes many new species of plants from Mexico and South America. Greenman (*Mo. Bot. Gard., Ann.*, v, 37) has published the second part of his monograph of *Senecio.* Extensive notes on North American trees are being published by Sargent (*Bot. Gaz.*, lxv, 423; lxvi, 229, 421), and the American willows are treated by Schneider (*ibid.*, lxv, 1, 117). Certain Philippine trees yielding commercial woods are described by Foxworthy (*Philippine Jour. Sci.*, xiii, 163). Merrill (*ibid.*, xiii, 1) describes Philippine plants of a variety of genera. Additions to Coker and Topten's *Trees of North Carolina* are listed by Ashe (*Jour. Elisha Mitchell Soc.*, xxxiv, 430). Smith (*Bull. Torrey Bot. Club*, xlv, 1, 167) continues his studies in the genus *Lupinus*, and Bicknell (*ibid.*, xlv, 365) his list of the flowering plants of Nantucket. A monograph of the grasses of Illinois by Mosher (Univ. of Ill. Agr. Exp. Sta. Bull. 205, 261) admits to the flora 204 species, more than one-fifth of which are noted for the first time in Illinois. Fernald (*Rhodora*, xx, 1, 29, 61, 90, 138, 152) furnishes many notes on New England plants, as also does Wiegand (*ibid.*, 81, 122) with special reference to the grasses. In an account of the taxonomy of the scrophulariaceous genus *Adenostigia*, Ferris (*Bull. Torrey Bot. Club*, xlv, 399) describes 21 species, of which three are new. Nelson and MacBride (*Bot. Gaz.*, lxv, 58) continue their western plant studies, devoting special attention to the genus *Clarkia*, while Payson (*Contr. U. S. Nat. Herb.*, xx, 133) gives a critical study with descriptions of new species of North American columbines.

Physiology and Ecology.—The development of plant physiological research in America and its applications in scientific agriculture and in the industries has never been more apparent. In spite of the establishment of new journals, the prompt publication of material presented is still a serious difficulty. Only indications may be furnished here of the lines of investigation in progress, but selections are made from the entire field, including the ecological aspect.

Hydration, or colloidal water relations, are accepted by Wolf (*Jour.*

Agr. Res., xiii, 253) in explanation of intumescences, and increased acid content is assumed. Bioletti and Flossfeder (Cal. Agr. Exp. Sta. Bull. 296, 369) discussed the effects of topping and pinching growing grapevines with the conclusion that ultimate injury is the rule. The relation of fruitfulness in the tomato to growth is found by Kraus and Kraybill (Ore. Agr. Exp. Sta. Bull. 149) to depend upon certain interrelations existing between water, carbohydrate, and nitrogen content. The direct assimilation of organic carbon by a green moss has been studied by Robbins (*Bot. Gaz.*, lxv, 543), who finds that levulose is more readily used than any other sugar. In the production of inulase by *Aspergillus*, Young (*Plant World*, xxi, 114) notes that while the enzyme is secreted under all conditions, the presence of inulin is most stimulating. Apparatus and methods for the measurement of respiration and photosynthesis are briefly presented by Osterhout (*Jour. Biol. Chem.*, xxxv, 337; *Am. Jour. Bot.*, v, 105). Harris (*Mem. Torrey Bot. Club*, xvii, 307) determines the osmotic concentration of desert mistletoes to be nearly twice as great as that of Jamaican montane species. In studying the marine algae, True (*Bot. Gaz.*, lxv, 71-92) finds that sodium chloride penetrates the cells much more rapidly than sugar, hence it seems to exhibit a higher osmotic surplus. Working with various potted plants, Duggar and Bonns (*Mo. Bot. Gard. Ann.*, v, 153) determined that the increase in transpiration due to Bordeaux mixture takes place mainly at night, so that the importance of guttation phenomena is considered. The process of hardening to resist frost injury in the cabbage is shown by Harvey (*Jour. Agr. Res.*, xv, 83) to consist in the gradual prevention of protein precipitation due to increase in hydrogen ion concentration and salt content.

In a study of mineral food requirements of wheat plants at different stages of growth McCall and Richards (*Jour. Am. Soc. Agron.*, x, 127) point out especially the importance of magnesium during late stages of development. Schreiner and Skinner (*ibid.*, x, 225) demonstrate the possibility of using their triangle system, so fruitful in physiological study, in field fertilizer experiments. Interesting relations of aldehydes as affecting plant growth on different soil types are developed by Skinner (*Jour. Franklin Inst.*, cxviii, 547). Appleman (*Am. Jour. Bot.*, iv, 2, 27) finds that sweet corn in the milk stage exhibits a very high respiratory rate, and catalase activity follows closely the respiratory curve. (See also XXIII, *Agricultural Chemistry.*)

McGee (*Plant World*, xxi, 13) has contributed data on the effects of chemicals added to sea water as modifying imbibitional swelling of certain marine algae, and MacDougal (88) furnishes interesting facts on the effects of bog and swamp waters on swelling in living and dried sections of plants and in bio-colloids. Bioletti, Cruess and Davi (*Univ. of Cal. Publ. Agr. Sci.*, iii, 103) have followed the changes in the chemical composition of grapes during ripening; Hasselbring (*Jour. Agr. Res.*, xiii, 9) considers the behavior of sweet potatoes in the ground, also (*ibid.*, xiv, 273) the effects of oxygen pressures on carbohydrate metabolism; while Gerecke (*Bot. Gaz.*, lxv, 344) reports upon the effects of rest and no-rest periods on the growth of *Solanum.* Setchell (*Proc. Am. Philos. Soc.*, lvii, 155) indicates especially how general is the extent of the parasitism of red algae upon their near relatives. That the application of sodium nitrate in the early stages of growth increases the yield of wheat and in late stages of growth augments the protein content of the grain and of the straw is shown by the investigation of Davidson and LeClerc (*Jour. Am. Soc. Agron.*, x). The physiological cultural characters of wood-rotting fungi on artificial media have been followed by Long and Harsch (*Jour. Agr. Res.*, xii, 33).

During the year many applications have been made of earlier work on the effect of the hydrogen ion concentration on the growth and physiological activities of many organisms, including fermentative and pathogenic bacteria, nitrogen-fixing bacteria, and fungi. Likewise there has been considerable activity in determining the specific effects of different chemical disinfectants upon microörganisms.

VERTEBRATE PALÆONTOLOGY

W. D. MATTHEW and W. K. GREGORY

General.—H. F. Osborn's *The Origin and Evolution of Life*, published in 1917, treats the fundamental biological problems from the viewpoint of palæontology. After developing the "energy concept of life" and describing the four complexes of energy that condition evolution, the author describes the evolution of the germ cell, character evolution, and the laws of adaptation. The second half of the work constitutes a splendidly illustrated summary of the evolution of fishes, amphibians, reptiles, birds and mammals. (See also *Organic Evolution, supra.*)

R. S. Lull's *Organic Evolution* deals very fully with the evidences of evolution. The evidence from the morphology and adaptations of recent and extinct types and the known palæontological history of many lines of the higher vertebrates are very fully described and illustrated.

Several recent papers and memoirs emphasize the close connections of palæontology with comparative anatomy. D. M. S. Watson (*Jour. Anat.*) has made a careful study of the pectoral girdle and forelimbs among the extinct South African mammal-like reptiles. In this connection he has endeavored to determine the probable location and attachments of the principal muscles of the forelimb, so far as they can be inferred by comparison of the fossils with the bones and muscles of the living reptiles. The possible movements and methods of walking are worked out. This leads to interesting conclusions on the evolution of the forelimbs in terrestrial vertebrates. W. K. Gregory and C. L. Camp (*Bull. Am. Mus. Nat. Hist.*, 1918) collate the results of earlier authors on the limb muscles of reptiles and mammals, and after applying them in a reconstruction of the limbs of an extinct reptile, *Cynognathus*, they discuss the evolution of quadrupedal locomotion in reptiles and mammals. The paper also deals with the much discussed problem of the homologies of the several coracoid elements of reptiles, mammals, and birds. L. A. Adams (*Ann. N. Y. Acad. Sci.*) traces the evolution of the jaw muscles of vertebrates from fishes to mammals. He gives reconstructions of the jaw muscles of five extinct vertebrates which are of exceptional morphological interest. The confusing synonomy of the jaw muscles in different classes of vertebrates is, so far as possible, cleared up.

The nomenclature of the elements of the skull in the earliest reptiles and amphibia is discussed in a report of a special committee of the Palæontological Society (*Bull. Geol. Soc. Am.*, xxviii, 973).

Fishes.—Part II of *The Fossil Fishes of the English Wealdon and Purbeck Formations* by A. S. Woodward (Palæontographical Society, 1916, published February, 1918) is adorned with many beautiful plates and accurate restorations of great interest to students of the evolution of the ganoid and teleost fishes. The lamented death of Dr. C. R. Eastman removes one of our foremost authorities on fossil fishes.

Classification of Fossil Amphibia and Reptiles.—D. M. S. Watson (*Proc. Zoöl. Soc.*, 1917, 167) gives a classification of the pre-Jurassic amphibia and reptiles, accompanied by charts showing the supposed relationships and evolutionary history of the principal groups. The classification is based especially on deep-seated "morphological" characters, as of the braincase and internal ear, to the knowledge of which the author has made many important contributions. The classification is purposely conservative in the matter of group names. It adopts the "phylogenetic" rather than the "group" method of arranging families.

Amphibia. — Fossil footprints from the upper palæozoic rocks of the Grand Canyon of the Colorado, recently described by Lull (*Am. Jour. Sci.*, 337) are of great interest because they are among the oldest known traces of four-footed animals, representing a group called the Protopoda which included the remote ancestors of the amphibia and reptiles. The notable investigations of Prof. S. W. Williston of the University of

Chicago on the extinct reptiles of North America have been stopped by his lamented death.

E. C. Case (*W. Virginia Geol. Surv.*, 803) describes certain fossil limb bones which seem to indicate the presence of Pareiasaurus-like reptiles in the Pennsylvanian era (Carboniferous) in West Virginia.

Broom and Haughton (*Ann. So. Afr. Mus.*, xii, 119) describe some new species of anomodont reptiles from the Permian of South Africa, and Haughton (*ibid.*, 127) gives a descriptive catalogue of the anomodonts in the South African Museum. C. C. Mook (*Jour. Geol.*, xxvi, 459) gives a thorough analysis of the habitat of the sauropod-dinosaurs, describing their physical and biological environment. L. M. Lambe (*Ottawa Naturalist*, xxxi, 66) describes a new genus of trachodont dinosaurs from the Edmonton formation of Alberta.

Birds.—The famous specimen of *Archæopteryx* in the British Museum has been carefully restudied by A. Smith Woodward and Branislav Petronievics (*Proc. Zoöl. Soc.*, 1918) who have discovered some new and important details as to the construction of its pectoral and pelvic girdles. They conclude that this most ancient known bird had very poor powers of flight and that the construction of its pectoral girdle recalls the conditions in the ratites. C. W. Andrews (*ibid.*, 519) describes a new fossil carinate bird from the Eocene (?) of Southern Nigeria.

Mammals.—The most important contribution dealing with fossil mammals is by H. E. Anthony on the "Indigenous Land Mammals of Porto Rico, Living and Extinct" (*Mem. Am. Mus. Nat. Hist.*). Recent discoveries by the author of a large fossil fauna. obtained from mountain caves, are fully described and illustrated. The evidence bearing on the geological history of the island and on its former connection with other Antillean islands and with the mainland is discussed. The extinct animals described are a peculiar little insectivore, a small ground sloth, and several rodents, all but the first related to the South American mammals, but none closely related.

H. Matsumoto (*Science Repts. Tôhoku Imp. Univ.* (Geol.), iii) has described a number of fossil mammals from Tertiary and Pleistocene formations in Japan, another region whose extinct animals, hitherto little known, throw much light on its former geography. Unlike the Antillean fossils these are closely related to the mainland fauna.

Matthew and Granger continue in the *American Museum Bulletin* their revision of the Lower Eocene mammals of North America. The present section discusses the insectivora and their relationship to other groups of mammals. Various new or little known genera are described, among them an interesting new genus believed to connect the primitive insectivores with the Edentates of South America on one hand and the Pangolins of the Old World on the other.

Fourtau has described, in a brochure issued by the Egyptian Survey Department, an interesting new fauna in the Moghara beds of Egypt, for the most part nearly related to the Lower Miocene fauna of Europe, but including some peculiar types. Minor contributions dealing with a new baboon from British East Africa (C. W. Andrews, *Ann. and Mag. Nat. Hist.* (8), xviii, 410) and a mastodon skeleton from South Carolina (F. B. Loomis, in *Am. Jour. Sci.*, xlv, 438) add to our knowledge of the past distribution of these animals, and the papers by Scharff (*Proc. Roy. Irish Acad.*, xxxiv, 33; *Irish Nat.*, xxvi, 173) on prehistoric animals from Irish caves are of much local interest.

Additional papers by Pycraft (*Sci. Prog.*, 1918, 389) and Gerrit Miller (*Am. Jour. Phys. Anthrop.*, i, No. 1) upon the "Piltdown Man" of England, and by Hrdlicka and others upon the fossil human remains from Vero, Fla. (Bur. Am. Ethnol., Bull. 66), continue the controversy upon these much disputed discoveries, but pertain rather to archæology than to palæontology (see also XXVI, *Anthropology*). To the same subject pertains the admirable memoir by S. A. Smith (*Trans. Royal Soc.*) descriptive of the Talgai skull from Queensland, Australia, an important relic of Pleistocene man.

XXV. THE MEDICAL SCIENCES

PHYSIOLOGY AND PHARMACOLOGY

S. J. MELTZER

Shock.—In the course of the European War traumatic shock was a tremendous factor in the mortality on the battlefield. This fact stimulated physiologists to an extensive study of the problem of shock. Two large committees were appointed for this purpose, one in the United States and another in England; some work also was done in France. Many articles appeared in the literature of the medical sciences, and there were numerous intercommunications between the various committees which did not appear in the press. Most of these investigations had a practical object in view—to find efficient remedies to meet or curb the dangers of shock. Most of the communications and the conclusions drawn from the experiments and observations do not come up to the standard of purely scientific work. It will be a task for the future to pass a critical judgment in a proper scientific spirit upon the work accomplished. As a phenomenon of scientific activities during the feverish war period, however, an account should be given here of the obtained facts and of some theories of shock, especially from the point of view of their practical availability.

The term shock was introduced in England nearly 150 years ago to designate the sudden onset or development of a dangerous state following a traumatic injury; no definite clinical signs accompanied manifestations of shock and no important anatomical changes were discovered at autopsies made on individuals who succumbed to shock. Since 1870 shock became a physiological problem, and a low blood pressure was recognized as a predominant clinical symptom of shock. For nearly six decades the theory prevailed that low blood pressure is, as a rule, accompanied by relaxation of the peripheral small arteries, the latter being due to a depression of the vaso-constrictor center in the medulla oblongata. Recently the view gained ascendancy that in shock, on the contrary, the small peripheral arteries are more contracted than normal. This view was based uopn theoretical considerations and experimental work, the validity of which need not be discussed here. The chief method for the experimental production of shock consists in opening the abdomen and exposing and manipulating the abdominal viscera.

Experimental Investigations. — In studying the problems of shock, Erlanger with his associates, R. Gessell, H. S. Gasser and B. L. Elliott (*Jour. Am. Med. Assoc.*, lxix, 2089; *Proc. Am. Physiol. Soc., Am. Jour. Physiol.*, xlv, 546, 547, 548) took low blood pressure as a sole criterion of shock. They produced low blood pressure by exposure of the abdominal viscera, by partial occlusion of the inferior vena cava, by administration of epinephrin, and by plugging the portal radicles in the liver (by means of injections of lycopodium spores). On the basis of their experiments and reports from the front, they venture to suggest "as the causative factor of shock, reduced circulation brought about possibly through the action of pain stimuli, and of a certain amount of hemorrhage, on the vaso-constrictor mechanisms, this reduced circulation starting in its train such events as follow, for instance, the injection of epinephrin and the temporal partial occlusion of the aorta, or of the vena cava." Shock is the outcome of a series of vicious cycles. Extensive trauma causes local plasma transudation. The blood volume is thereby materially reduced, causing general vaso-constriction, which is further increased by the pain reflex. The consequent slowing of the blood stream causes generalized transudation, and the arterial pressure becomes so low that the vaso-constrictor centre suffers and the pressure falls still lower, while the alkaline blood reserve is simultaneously diminished. The blood volume was determined by the acacia method and blood counts were made. The plasma was reduced in the average 22 per cent. of the total blood volume (seven per cent. only in the case of acacia). Hemorrhage into the tissues and regions of stasis accounted in some cases for part of the diminution of blood volume. Increased permeability of vessels was the probable cause of the plasma transudation. Injection of large amounts (20 per cent. acacia) simply increases the blood volume; in etherized and intact animals the blood may be made up to 10 per cent. and four per cent. solution, respectively, without symptoms of disturbance. After hemorrhage acacia maintains the blood pressure better than salt solution.

Wiggers (*Am. Jour. Physiol.*, xlv, 485; *Jour. Am. Med. Assoc.*, lxx, 508) studied experimental shock by exposing the intestines to the air without handling them. He distinguishes three stages—the initial, the progressive, and the complete circulatory failure. The initial stage lasts about 30 minutes, during which effective venous pressure and cardiac discharge are not reduced but the arterial pressure shows distinct alterations. In the progressive stage, which lasts from two to three hours, venous pressure and cardiac efficiency fail progressively and the arterial blood pressure falls toward a low level. In circulatory failure the venous pressure reaches its lowest level and arterial pressure falls until death supervenes. Wiggers disagrees with the view which is now in the ascendancy that in shock the resistance in the peripheral vessels is increased. The course of the circulatory failure produced by exposure of the intestines may be divided into three stages. During the initial stage the mean arterial pressure falls slightly or may be maintained, but the arterial pressure variations recorded optically indicate that the volume of blood contained in the large arteries is reduced. As the contour of the intraventricular pressure curves do not alter as the heart rate increases, and as the pulmonary arterial pressure remains unaltered, the conclusion is reached that the reduction in the blood content and fall of pressure in the arteries is not due to a decrease in the minute volume of the heart, but to a reduction in the total arterial resistance. During the second stage the arterial pressures progressively fall, and it is concluded that a deficient ejection of the ventricle occurs in spite of an increased heart rate. During the final stage these changes may be accentuated; the heart slows, causing a further fall of arterial pressure, until the animal dies of respiratory failure. The dynamics operating in abdominal shock and from prolonged arterial hemorrhage are precisely alike. Nitrates effect a pronounced and rapid fall of arterial pressure by a reduction of peripheral resistance. Prolonged vaso-dilatation, then, in itself does not lead to complete circulatory failure. The dynamic changes in circulatory failure following acute cardiac failure and intravenous injections of neutral oil are described. In considering the treatment of circulatory failure in shock, it must be borne in mind that the reduced peripheral resistance must be overcome and the deficient venous return must be replenished. The various methods employed for these purposes are described. The differentiation of circulatory failure such as is found in surgical shock from other types of circulatory failure cannot be emphasized too strongly. It appears to Wiggers doubtful whether exposure of the intestines is comparable with the effect produced by massive wounds of the limbs.

Githens and Meltzer (*Proc. Soc. Exp. Biol. and Med.*, xv, 70) studied experimental shock in a large number of dogs. As criteria for shock they took a critical blood pressure (levels below 70 mm. of mercury) and the non-reappearance of sensation long after the removal of ether anesthesia. Of these dogs, in 15 which had originally high blood pressures, even after four hours the blood pressure never reached a level below 95 mm., and sensation returned as soon as the animals came out of ether. In 13 dogs the blood pressure reached a level below 70 mm. of mercury within 2½ hours and there was no return of pain sense. In eight dogs the blood pressure sank to a low level but sensation of pain returned when ether was discontinued. In six dogs sensation was lost but the blood pressure remained above 95 mm. of mercury. In three dogs sensation completely disappeared and blood pressure sank very low in less than half an hour; they were sickly dogs.

Wiggers (*Am. Jour. Physiol.*, xlvi, 314) studied among others circulatory changes following prolonged sensory stimulation, and comes to the conclusion that "a state of shock involving the central nervous system can be produced experimentally by trauma. This state may persist from two to five hours, after which recovery sets in; or it may be fatal." He concludes further that prolonged sensory stimulation may cause a temporary depression of the functions of the central nervous system but in itself does not lead to permanent changes or death.

In studying experimental shock, Githens, Kleiner, Meyer and Meltzer (*Proc. Soc. Exp. Biol. and Med.*, xvi, Oct., 1918) came across a method which seemed to be effective in producing shock in every case and fairly early. The signs of shock were obtained with this method in an unbroken series of experiments. The method consists in repeated strong compression with thumb and finger of the small gut of the animals (cats and dogs), care being taken to avoid traction upon the mesentery. In all the animals a considerable fall of blood pressure was obtained (even as much as 145 to 45 mm.) within an hour and 15 minutes. Loss of pain sense was noted early. In not a single instance did the pain sense return at any time. The same authors (*ibid.*) studied the influence of various factors upon the blood flow from the femoral vein in cats. The mere opening of the abdomen causes an immediate decrease of an average of 36 per cent. in the rate of flow. In shock the average decrease amounted to 30 per cent. of the original rate of flow. Section of the sciatic nerve during shock increased the flow again to about one-half of the rate which prevailed during shock; the flow never reached the original rate. The fact that the blood flow after section of the sciatic nerve in shock is usually far beyond normal does not support the now current assumption that vaso-constriction is greater in shock than in normal conditions of the animal—in further experimental studies of surgical shock, F. C. Mann (*Jour. Am. Med. Assoc.*, lxxi, 1184) found that two hours after applying a strong ligature to all the structures of each extremity except the major artery, the animal generally exhibits the signs of shock. He found further that by stimulation of the central end of the vagus or of the superior laryngeal nerves, which under light anesthesia causes only a temporary inhibition of the respiration, under deep etherization it is possible in many instances actually to kill the animal. Mann is inclined to believe that in most instances in which the primary factor is the nervous system, the course will be found to be of the nature of inhibition, as held by Meltzer.

Cannon, Frazer and Hooper studied at the front some alterations in the distribution and character of blood in shock and hemorrhage (*ibid.*, lxx, 527). They found that in severe traumatic shock the red-cell count is very high and it is higher in the capillary blood than in the blood of the veins. In cases of hemorrhage the capillary red count is usually much lower than in the case of shock alone. Another feature of hemorrhage is a relatively low hemoglobin reading. Cannon (*ibid.*, 531) comes to the conclusion that low blood pressure in shock or hemorrhage is due primarily to an acidosis.

In the last two decades various writers have stated that in shock the blood volume in the circulatory apparatus is diminished. The decrease of blood volume is mainly recognized by an increase in the number of red blood cells. It is assumed by most of the writers that the diminution is due to an exudation of plasma from the blood into the tissues (Sherrington and Coopeman, Vale, Mann, Erlanger and his collaborators, Macleod, etc.). Cannon, who found, as mentioned before, that in shock the increase of red cells takes place greatly in the capillaries, seems to assume that blood accumulates mostly within the capillaries. Cannon's view is not perfectly clear. Although he assumes with other writers that the peripheral vessels in shock are more contracted than in a normal state, he speaks nevertheless of the vessels being dilated due to an influence of acidosis within and outside of the vessels. Cannon suggests to supplant shock by the term "exemia."

Porter, who investigated the problem of shock in the laboratory as well as at the front, came to the conclusion that shock is simply due to pulmonary fat embolism. His views are set down in short articles in the *Boston Medical and Surgical Journal* (lxxv, 854; lxxvi, 248, 322, 699; lxxviii, 657) and in articles which appeared in the *Atlantic Monthly.* Wiggers (*Proc. Soc. Exp. Biol. and Med.*, xv, 34), who investigated this subject, comes to the conclusion that neither the intravenous nor the intra-arterial injection of fat into an animal produces changes in the dynamics of the entire circulation comparable to those found in shock following exposure of the intestine, and believes also that his results do not corroborate the hypothesis that fat emboli, either of the pulmonary or systemic vessels, are the cause of the circulatory failures in surgical or traumatic shock.

Theories of Shock; Theory of Acapnia.—This theory was brought forward by Yandell Henderson some ten years ago. It assumes that shock is due to a diminution of CO_2 in the blood of shock patients. This assumption suggests at the same time the treatment; it consists in letting the patient breathe some carbon dioxide, or respire through a long tube, rebreathing. Henderson with many coworkers published in the course of the last decade many articles on the subject. Outside of Henderson and his associates the theory of acapnia was not accepted by physiological investigators. Most of the investigators could not confirm the fact of a diminution of carbon dioxide in the blood of animals in which shock was produced by other methods than the one employed by Henderson. Investigators who employed Henderson's method, namely, forced pulmonary ventilation, and succeeded in causing shock, found that this condition was produced by the interference with the proper circulation and not due to a reduction of carbon dioxide. Recently, Henderson in collaboration with others introduced the theory of acapnia in a modified form. In a review of acapnia and shock Macleod (*Jour. Lab. and Clin. Med.*, April, 1918) says that "the acapnia theory of shock was dignified some eight years ago by an apparently adequate burial," and his view of the new, reincarnated acapnia theory which has now sprung into being Macleod sums up by saying that no new fact is contributed to controvert the many objections that have been raised against the original theory. In the circles of practical medicine, however, rebreathing is still recognized as a practical therapeutic measure. For this reason the recent statement by Henderson and Haggard (*Jour. Biol. Chem.*, Feb., 1918, 370) deserves to be quoted: "In the light of our observations we should expect this treatment to hasten the recovery of those cases whose CO_2 capacity was still above the critical level and who would therefore in all probability have recovered slowly without treatment, but to be only a means of temporarily prolonging life in cases in which the CO_2 capacity had already sunk below the critical level." To this we need only to add that Geofrey Marshall, an expert anesthetist, is of the opinion that rebreathing is rather a dangerous procedure and ought not to be used in shock patients.

Theory of Acidosis.—Before going abroad, Cannon, who believed and believes that in shock the peripheral arteries are more contracted than normal, explained (*Boston Med. and Surg. Jour.*, June 21, 1917) the phenomenon of shock by the assumption that in this condition a great deal of the blood is trapped in the capillaries of the abdominal vessels on account of the constriction of the small mesentery arteries on one side and the small liver vessels on the other side, and recommended as a therapeutic measure the introperitoneal injection of pituitrin, supposedly to cause a constriction of the engorged vessels. At the theatre of war, however, he met surgeons who assured him that they made laparotomies on shocked patients and never found that the abdominal vessels were engorged. Abandoning his previous theory, Cannon became converted to the theory that acidosis is the primary cause of shock (*Jour. Am. Med. Assoc.*, lxx, 531, 611, 618). Working on this basis, Cannon recommended the injection of solutions of bicarbonate of soda in shock. Bayliss had previously recommended the treatment of shock by intravenous injections of a six per cent. gum-acacia solution. Both scientists together have now recommended a solution which should contain both gum acacia and bicarbonate of soda. The theory of acidosis, however, did not find support in the work of other investigators, and recently Bayliss expressed himself against the assumption that acidosis is the primary cause of shock and is not employing bicarbonate of soda in his acacia solutions. If I am not mistaken, Cannon himself is not any more a strong advocate of the use of bicarbonate of soda in shock. (See also *Medicine, infra.*)

Theory of Pulmonary Fat Embolism.—There are two facts in Porter's statements with which few will disagree, namely, that the intravenous injection of oil is capable of producing a dangerous drop of blood pressure and that injuries to the long bones may cause pulmonary fat embolism. Both facts are true, but they are not new. But on the basis of his theory, Porter recommended the treatment of shock by inhalation of CO_2 or by rebreathing. The background of this recommendation is the assumption that CO_2 will, to use Porter's own words, "drive the blood from the engorged abdominal veins into the chest where it shall fill the half-empty heart and permit the faithful organ to fill the capillaries." Now Wiggers is certainly right when he says, that if the circulation from the right ventricle is impeded by capillary emboli in the lungs, the introduction of larger quantities of blood in the right ventricle might lead to the dilatation of that ventricle and to death. Porter offers as evidence for the correctness of his claim the bare statement that he saved many lives by the use of the method recommended by him. Porter quotes in his articles only a few cases and his diagnosis that these cases were suffering from shock was based exclusively upon the fact that they had a low blood pressure. Did these cases suffer from pulmonary fat embolism? Here is a practical question of diagnosis which Porter, the physiologist, did not seem to have taken into consideration. The localized disease of pulmonary fat embolism is diagnosed by well defined symptoms. The patient looks cyanotic and suffers from air-hunger dyspnœa. Pulmonary edema is frequently present and even hemoptysis. On auscultation râles are present. In a drop of blood numerous fat droplets are present. Fat droplets are present in the urine and often also in the sputum. Porter mentions nowhere that he looked for these symptoms and found them.

There is a moral to the above analysis which the reviewer wishes to point out. Men, distinguished in the sciences of medicine, accustomed to careful methods of scientific investigation, ventured into the field of practice. By their anxiety to "do their bit" they have accomplished but little, either for science or for practice. Are the results attained in other sciences better? This is for others to answer —and in an unbiased future.

PATHOLOGY AND BACTERIOLOGY

MARTHA WOLLSTEIN

Influenza.—The results of the bacteriological investigation of the pandemic of influenza that reached the Atlantic coast of the United States in August, 1918 (see *Medicine*, and *Public Health*, *infra*) vary somewhat. Most observers are agreed, however, that the influenza bacillus is the etiological factor in the disease. Thus Park (*N. Y. Med. Jour.*, cviii, 621) states that the investigators at the research laboratories of the New York City Board of Health under Dr. Williams found the influenza bacillus in almost every case of clear-cut infectious influenza. The streptococcus and pneumococcus are superimposed upon the primary influenzal infection, he believes. Major Schorer, who studied the epidemic at the Port of Embarkation (*ibid.*, 641) came to the conclusion that there is no doubt that *B. influenzae* is the cause of the disease and that the complicating organisms are determined by the type of bacteria prevailing at the particular camp or cantonment. This would explain the larger incidence of pneumococcus complications in some locations and the greater number of streptococcus secondary infections in other places. At Camp Mills 88 per cent. of all cases showed *B. influenzae* (*ibid.*, 709). Keegan in Massachusetts (see also *Medicine, infra*) found the influenza bacillus in the lungs of 82.6 per cent. of the cases which came to autopsy, and in 31.6 per cent. it was present in pure culture (*Jour. Am. Med. Assoc.*, lxxi, 1051). Synnot and Clark, on the other hand, did not find it pure in any case examined at Camp Dix, N. J. (*ibid.*, 1816). Brem, Bolling and Casper (*ibid.*, 2138) observed the pandemic at Camp Fremont, Cal. Among 3,000 patients there were 408 cases of pneumonia, and no deaths occurred without this complication. They studied 20 cases *post mortem* and found the influenza bacillus present only three times. The type of pneumococcus most frequently found was type IV. They conclude that the organism of the initial infection of the epidemic is unknown, and that it is probably an ultra-microscopic filterable virus. This initial infection has a depressant influence on the bone marrow and thus causes hemorrhages and leukopenia, both of which are symptoms characteristic of the disease.

The interesting feature of the pathology of the disease is the condition present in the lungs. Symmers (*N. Y. Med. Jour.*, cviii, 621) describes the characteristic lesion as a lobular exudivate, pneumonia becoming rapidly confluent. Hemorrhages are numerous in the alveoli and pleura and marked bronchitis is present.

Pneumonia.—An epidemic of measles among the soldiers in several Army camps was followed in the early months of 1918 by many cases of pneumonia. Cole and MacCallum studied one outbreak as it occurred in Texas (*Jour. Am. Med. Assoc.*, lxx, 1146). They found that the characteristic lesion was an interstitial broncho-pneumonia, with a tendency to purulent infiltration and abscess formation as well as a great deal of hemorrhage and congestion. Bacteriologically they found the streptococcus hemolyticus in the lungs in practically every case, and *B. influenzae* in 13 out of 16 cases studied. The streptococcus was assumed to be the cause of the pneumonia. The influenza bacillus was ignored. Clendening (*Am. Jour. Med. Sci.*, clvi, 575) found that a post-measles broncho-pneumonia due to streptococcus hemolyticus has a high mortality rate (42 of 89 cases died) and a high incidence of empyema. Streptococcus reinfection of lobar pneumonia patients was also followed by a high mortality due to sepsis. Primary streptococcus broncho-pneumonia, on the other hand, was less severe and less fatal. Blake's studies showed the necessity of separating streptococcus carriers from other patients in measles and pneumonia wards. (See also *Medicine, infra.*)

Quigley (*Jour. Inf. Dis.*, xxiii, 21) studied the sputum and urine of 100 patients for type of infection and precipitate reaction. He found that 81 per cent. of cases of Types I, II, and III pneumococcus infection showed the precipitate reaction in the urine (*A. Y. B.*, 1917, p. 647). The precipitate reaction always corresponded to the type of organism isolated from the sputum and is the most simple and rapid means of type determination. It is not always present early enough to warrant neglect of the sputum examination for type determination.

Dysentery.—Whitmore, Fennel and Petersen (*Jour. Am. Med. Assoc.*, lxx, 427) used lipovaccines of meningococci, pneumococci, typhoid bacilli, paratyphoid bacilli and dysentery bacilli. They found that the vaccine requires greater labor and expense in its preparation but that the response is also greater. A single dose is followed by an agglutination titre usually produced by three doses of aqueous vaccines in the case of the triple typhoid and paratyphoid preparations. In a later article (*ibid.*, 902) Whitmore and Fennel report further on the lipovaccines of the dysentery bacillus. They found that any vegetable oil makes a satisfactory vehicle. No marked local or general reaction followed a dose of 3,000 million Shiga-type of dysentery bacilli, 3,200 million Y-type, and 2,200 million Flexner-type given to men. Immune bodies for these bacilli were demonstrable in the blood of vaccinated animals and men. The dose must be given subcutaneously and care should be taken to avoid a vein, because of the possible danger of fat embolism.

The subject of "Vaccination against *Bacilli Dysenteriae*" was investigated by Olitsky (*Jour. Exp. Med.*, xxiii, 69). Active immunization against dysentery bacilli has not given satisfactory results because killed bacilli suspended in salt solution or killed broth cultures have proved too toxic for practical use on human beings. During the last two years French investigators used certain vegetable oils in making vaccines of typhoid and paratyphoid bacilli. Olitsky found that the oil of sweet almonds, neutralized to eliminate the free fatty acids, makes an excellent vehicle in which to suspend the dysentery bacilli. Such oily vaccines, when injected into human beings, gave but slight local and general reactions, and yet protection was afforded and specific antibodies appeared in the blood. The explanation of the action of the oil is that it allows the bacilli to disintegrate gradually; consequently the local toxic action on the tissues is minimized, and as absorption is also slow, the general reaction is diminished or absent. The antigenic power of the suspended bacilli, however, remains unimpaired.

Weil's Disease. — Noguchi (*ibid.*, xxvii, 575) worked out the morphological characteristics and nomenclature of *Leptospira* (*Spirochæta*) *icterohæmorrhagica* (Inada and Ido, *A. Y. B.*, 1916, p. 690) and gave the causative agent of infectious jaundice the independent generic name of *Leptospira*, denoting the peculiar minute spirals running throughout the body. The organism is also distinguished by the absence of a terminal flagellum and its caudal portion is very flexible. In its resistance to the action of 10 per cent. saponin, this organism differs from all other so-called spirochetes.

Noguchi also studied the survival of *Leptospira* (*Spirochæta*) *icterohæmorrhagica* in nature (*ibid.*, 609), and found that it survives less than 24 hours in acid urine, but somewhat longer in neutralized or slightly alkalized urine. Under natural conditions *Leptospira icterohæmorrhagica* cast off in the feces cannot survive more than 24 hours, and polluted water, sewage or soil will not keep the organisms alive longer than three days. Certain pathogenic bacteria (*B. typhosus, B. paratyphosus, B. dependeriae, pneumococcus*) are antagonistic to the growth of the spirochete, which is highly sensitive to the destructive action of bile, bile salts and sodium oleate. Finally, experiments showed that neither the Culex mosquito, the larvae of the horse-fly and bluebottle fly, wood ticks nor leeches can play the part of an intermediary host for *Leptospira icterohæmorrhagica*.

Serum Diagnosis of Syphilis.— Noguchi (*ibid.*, xxviii, 43) has simplified the serodiagnosis of syphilis by eliminating the use of foreign complement and foreign corpuscles. Instead, the author made use of the complement and corpuscles in the fresh human blood to be tested. The human complement requires a larger amount of antihuman hemolytic ambocepter than guinea-pig complement does. An insufficient amount of complement in the serum to be tested can be supplemented by the addition of a proper amount of fresh, active, negative serum. Noguchi emphasizes the necessity of using only the acetone-insoluble fraction of tissue lipoids as antigen when the human complement is utilized in the fixation test.

Lymphocytes. — Murphy and Taylor, investigating the lymphocyte in natural and induced resistance to transplanted cancer and the effect of X-rays on artificially induced immunity (*ibid.*, 1) worked with mice and X-rays. They found again that the lymphocytes are a potent factor in immunity cancer in the mouse, both in bringing about and in maintaining that condition. They found that mice which had been artificially immunized against a transplantable carcinoma could again be rendered susceptible to the same tumor by exposure to the X-rays, while the immune animals not treated with the X-ray preserve, to a large degree, their resistance to a second inoculation of the tumor in question.

Hektoen has studied the relation of the "Roentgen Ray and Antibody Production" (*Jour. Inf. Dis.*, xxii, 28). He exposed dogs and rabbits to roentgen rays at about the same time that an antigen was introduced, and found that production of antibodies is restrained largely or even completely. This corresponds to the results obtained with white rats. At the height of antibody production the ray appears to have little, if any, effect on the antibodies in the blood. The results agree with the view that antibodies are produced in the spleen, lymphatic tissues and marrow, and that one reason why the lymphocyte seems to be an agent of defense in tuberculosis and other conditions may be its power to form antibodies.

Meningococcus.—Mathers and Herrold (*ibid.*, 523) made a study of a military camp and found three to six per cent. of meningococcus carriers, most of them temporary, and only one to two per cent. chronic. They found by macroscopic agglutination tests two biological groups of meningococci, with some atypical strains in each. The type of meningococcus predominating in the camp epidemic was identical with that prevailing among the chronic carriers. Also the type found in the cases and in the corresponding immediate contacts was the same in every instance. This suggests a close relationship between cases of epidemic meningitis and meningococcus carriers.

Gates reports on "Antimeningitis Vaccination and Observations on Agglutinins in the Blood of Chronic Meningococcus Carriers" (*Jour. Exp. Med.*, xxviii, 449). He inoculated 3,702 soldiers with three doses of dead meningococci, giving 2,000, 4,000 and 8,000 million cocci subcutaneously at weekly intervals. Only mild local and general reactions followed except in a few cases of individual susceptibility, when symptoms of meningeal irritation sometimes developed. Specific meningococcus agglutinins were demonstrated in the blood serum of the vaccinated men, and also in the blood serum of chronic carriers of the meningococcus. This latter fact shows that the relative immunity of chronic carriers to epidemic meningitis may be due to the presence of specific antibodies in the blood stream.

Diphtheroids.—Eberson has made an exhaustive study of "Diphtheroid Organisms" (*Jour. Inf. Dis.*, xxiii, 1) and classified them tentatively into nine groups with a type species for each and corresponding subspecies. The author concludes from his experiments that the diphtheroids associated with Hodgkin's disease are not its cause. He also concludes from his biological studies of these organisms that they are not readily transformed into cocci and back again, but that they conform to the fundamental laws of bacteriology in this respect.

Streptococci. — Kinsella and Swift (*Jour. Exp. Med.*, xxviii, 169) have classified the hemolytic streptococci and found the variety to be homogeneous, consisting of members which are nearly identical. Kinsella (*ibid.*, 181) found the non-hemolytic streptococci to be a heterogeneous variety. The reaction between the two is orderly. The conclusion is reached that unique varieties of bacteria are apparently more highly invasive for man, whereas heterogeneous varieties are more saprophytic. The streptococcus thus parallels the pneumococcus and colon-typhoid groups of organisms.

Immunity. — Meyer, Hurwitz and Taussig continued their studies on the blood proteins, taking up the problems of "Albumin-Globulin Ratio in Antitoxic Immunity" (*Jour. Inf. Dis.*, xxii, 1). They found that while the percentage of serum globulins increases markedly during the course of immunization with diphtheria, tetanus and botulism toxin, there is no constant relationship between the percentage of increase in the serum globulin and the antitoxic potency of the serum. The rise in globulins may be one manifestation of an upset in the delicate protein balance of the blood, resulting from the disturbed metabolism following toxin inoculations.

MEDICINE

Walter Walker Palmer

Reactions of the War on Medical Science. — Almost immediately after the United States declared war on Germany, research in civil medicine in this country ceased. Most of the contributions of a new and important nature, therefore, come from the military camps. The large numbers of men involved and the unusual control possible have opened opportunities for research unparalleled heretofore. Many facts have been discovered that are of very great importance from a military point of view and certain of these facts have a significant bearing on future civilian medicine. In addition to the investigations carried on, military medicine has served a most useful and far-reaching educational function. Well trained and experienced men were early placed in command of base hospitals, and training schools for physicians were established which made it possible to fill the personnel of the large hospital organizations with adequately trained men. As a result of this experience and training, thousands of doctors will return to their respective communities able to practice better and more intelligent medicine than before the war.

Cerebro-spinal Meningitis. — Since the mobilization of troops in this country there have been epidemics of cerebro-spinal meningitis of varying severity in several of the camps. None, however, has reached alarming proportions. A real contribution to the treatment of the disease has been made by Major Herrick, in charge of the medical service in the Base Hospital at Camp Jackson, South Carolina (*Arch. Int. Med.*, xxi, 541). He emphasizes the great importance of making an early diagnosis, which often depends upon keen and accurate clinical observation. Unusual opportunities were afforded at the camp hospital for study of the early phases of the disease. The men were under excellent control and were seen early, as the commanding officer had instructed the regimental surgeon to send all cases with headache, fever, vomiting or other suggestive symptoms to the Base Hospital without delay. Blood cultures and examinations of the spinal fluid revealed the fact, as had been previously pointed out, that the meningococcus not infrequently may be found in the blood stream before there are definite meningeal signs of infection. As an aid in recognizing these cases early clinically, Major Herrick points out certain signs and symptoms that should arouse suspicion. In the pre-meningitic stage the patient complains of headache, is irritable, lies on the side, resents exposure, has a moderately high fever (seldom over 102) and slow pulse, and presents slight cyanosis, frequently an upper respiratory infection, a heavily coated tongue, mottling of the skin, macular rash which resembles large rose spots, later becoming petechial (most commonly seen about shoulders and pelvic region but may appear on any part of the body), and exaggerated and irregular deep reflexes. Confirmatory evidence of the process being general is the fact that pericarditis, endocarditis, suppuration, pleurisy, otitis media, and arthritis due to the meningococcus are occasionally found complicating the disease. The procedure followed in the treatment of these cases is the intravenous administration of serum in 50-120 cc. amounts as soon as the clinical diagnosis is made. The usual precautions of desensitization and intravenous serum injections are always observed. The number of intravenous treatments depends upon the progress of the case; in general, the same principles advised for the serum treatment of pneumonia govern the situation. Intraspinal administration of serum is not started until there is positive evidence of meningitis, as shown in examination of the spinal fluid; it is then carried out in the usual manner. From the data given it would seem that the mortality had been materially reduced, from the usual 25 per cent. to about 16 per cent.

Trench Fever.—Soon after the beginning of the war in 1914, with the establishment of trench warfare, there appeared a disease characterized by fever of about a week's duration, headache, pain in the back and legs, frequently followed by short relapses at intervals of a week or 10 days but seldom resulting fatally. It was of great importance from a military standpoint because it removed from the fighting line large numbers of men and brought added strain on the various armies in caring for the men. At one time 60 per cent. of all sickness in the British troops in Flanders was due to trench fever. Descriptions of the disease as it occurred in Flanders began to appear in the latter part of 1915 and early 1916 under the name "trench fever" (see Graham, *Lancet*, 1915, ii, 703; Hunt and Rankin, *ibid.*, 1133; McNee, Brunt and Renshaw, *Brit. Med. Jour.*, 1916, i, 225). References to the disease are found in the literature under various names, as Wolhynian fever, quintan or five-days' fever, Polish fever, Russian intermittent fever, Meuse fever, His-Werne disease, goiter-pain fever, shin fever, French shin and shank fever. It seems quite certain, however, that it was prevalent on all fronts among the troops of both the Allies and the Central Powers. McNee, Renshaw and Brunt (*loc. cit.*) in February, 1916, gave a very excellent clinical description of the disorder and demonstrated by their experiments that it could be transmitted readily from one person to another by the blood. The incubation period was found to vary from six to 22 days. As a result of the investigation of these authors the conclusion was reached that the virus is found in the corpuscles of the blood and does not pass a filter. The fact that only two classes of men were affected, those from the trench zone and men of the Royal Army Medical Corps, led them to suggest that the disease is either contagious from man to man or, as seemed much more likely, is carried by one of the common flies or parasites found in the trenches. During the summer of 1915 lice, mosquitoes, midges and flies of all kinds were common in the Flanders war zone. Recently there has appeared a report of a commission appointed at the suggestion of the Medical Research Committee of the American Red Cross, which covers all prior reports of the disease (*Trench Fever: Report of Commission, Medical Research Committee, American Red Cross,* Oxford University Press, 1918) and records investigations of the commission itself. Eighty-two subjects for experimentation were selected from several hundred men of the American forces overseas who offered themselves for the studies. The conclusions reached differ somewhat from those reached by earlier investigators. Trench fever was found to be a specific, infectious disease, due to a resistant filtrable virus. The virus is present in the blood plasma of men ill with trench fever and such plasma will produce the disease if inoculated into healthy individuals. The disease is transmitted naturally by the louse (*pediculus humanus, Linn.*, var, *corporis*). It may be transmitted by the bite alone, which is the usual manner of infection, or by scarifying the skin and rubbing into the abrasion a small amount of the excrement of the infected louse. The virus is sometimes found in sputum and urine of trench-fever cases. Certain sanitary regulations directed toward eliminating the louse from the clothing and individual are recommended.

Influenza.—One of the great tragedies of the year has been the virulent and widespread epidemic of influenza or "Spanish influenza", as it is more frequently called. For the past year and a half the usual non-fatal type of influenza or "grip" has been prevalent in all the armies as well as among the civilians in the warring countries. In August there started in Boston and soon spread to neighboring cantonments and eventually over the entire country a most virulent form of the disease with an exceedingly fatal complicating broncho-pneumonia. In the middle of December it was estimated that the total deaths in the United States from influenza since the beginning of the epidemic is between three and four hundred thousand. The deaths from this disease in the army camps numbered about 20,000. The deaths in the United States Army on the battlefield for the entire campaign numbered approximately 50,000. (See also *Public Health, infra.*)

The etiology is still in doubt and at present very little authoritative work has been published. Search for the influenza bacillus described by Pfeiffer in 1892 has attracted all workers from the beginning. Probably the best report to date is the one of Keegan from Chelsea, Mass. (*Jour. Am. Med. Assoc.*, lxxi, 1051). In the U. S. Naval Hospital at Chelsea, five to 10 per cent. of the cases of influenza developed a massive and fatal broncho-pneumonia. The influenza bacillus was recovered from the lungs of 82 per cent. of the fatal cases; in 30 per cent. it was found in pure cultures. The pneumonia, however, was frequently complicated by pneumococcus or streptococcus infection. Attempts to produce the disease by introducing the filtrate of nasal and throat washing from two typical cases into the anterior nares of nine volunteers failed to produce the disease. Subsequent reports from various sections of the country differ considerably in the bacteriological findings. The clinical reports agree consistently. (See also *Pathology and Bacteriology, supra.*)

Pneumonia. — That man may be successfully protected against pneumococcal infection and more particularly against lobar pneumonia has been demonstrated in a most thorough and convincing manner by F. S. Lister, research bacteriologist to the South African Institute for Medical Research (*Publ. South African Inst. Med Res.*, X, Nov. 10, 1917). Lobar pneumonia has been a very serious menace to the native workers in the South African gold and diamond mines ever since their development. The disease exists in epidemic form practically throughout the entire year and causes great sacrifice of life as well as great economic loss. This may be well appreciated from the fact that in 1910 at the Premier diamond mine the pneumonia incidence per thousand per annum was 153.54, with a pneumonia mortality per thousand per annum of 28.97, and when it is known that there are several hundred thousand workers, the very great importance of this disease is clear. Lister's investigations were conducted at the Premier (diamond) and Crown (gold) mines in the Transvaal and the De Beers (diamond) mines at Kimberley, extending over a period from Nov. 1, 1916, to Oct. 31, 1917. The author's first task was to determine the various types of pneumococci which caused lobar pneumonia. It was found that 63 to 77 per cent. of all cases of lobar pneumonia occurring in the native mine laborers is caused by the pneumococcus of one or other of the groups "A", "B" or "C" (see F. S. Lister, "The Serological Classification of Pneumococci," *ibid.*, II, Dec., 1913). Group "A" is unknown in the United States, and groups "B" and "C" correspond to groups II and I, respectively, described by Dochez and Gillespie (*Jour. Am. Med. Assoc.*, 1913, lxi, 727). A triple vaccine comprising the groups "A", "B" and "C" equally represented was prepared, with which the men were inoculated. The dose employed was one cubic centimetre of vaccine, containing 8,000 million bacteria. A very remarkable reduction of the incidence and mortality in pneumonia occurred. In the Premier diamond mine, during the year, Nov., 1916, to Oct., 1917, when vaccination was carried out, the pneumonia incidence per thousand per annum was only 4.67, with a pneumonia mortality per thousand per annum of 0.86. These results are most gratifying and promise much for the future in preventive medicine.

Soon after mobilization in the United States, pneumonia became prevalent and threatened to become a very serious menace to the troops. Prophylaxis through inoculation was undertaken at Camp Upton by Russell L. Cecil and J. Harold Austin (*Jour. Exp. Med.*, xxviii, 19). Protective power against types I and II but not against type III was found in the serum of vaccinated individuals. At Camp Upton 12,519 men were vaccinated against types I, II and III, using a total dosage of six to nine million bacteria given in three injections at weekly intervals. For the 10 weeks following the vaccination no cases of pneumonia of the three types used in vaccination developed. In the control group of approximately 20,000 men there were 26 cases of pneumococcus types I, II and III pneumonias during the same period. Another interesting fact was observed in that the pneumococcus type IV pneumonia and streptococcus pneumonia was made less among the vaccinated than among the unvaccinated. Though the results of these authors were in no way so striking as those obtained by Lister in South Africa, they, nevertheless, are significant in pointing the way to future policy. (See also *Public Health, infra.*)

Measles.—In the winter of 1917-18 a most serious outbreak of measles complicated by pneumonia occurred in several of the southern cantonments. A commission under the direction of Drs. Cole and MacCallum was sent by the Surgeon-General's Office to investigate the situation (*Jour. Am. Med. Assoc.*, lxx, 1146). The commission came to the conclusion that at the base hospital where their studies were made, and because of its similarity presumably at the other base hospitals, the pneumonia was of two varieties: first, acute lobar pneumonia which does not differ essentially from that which occurs elsewhere; and second, broncho-pneumonia, which in most cases follows measles. The etiologic agent in the cases of acute lobar pneumonia was invariably pneumococcus, while in the broncho-pneumonia more frequently following or complicating measles, the hemolytic streptococcus was found to be the cause. Streptococcus infections following lobar pneumonia were found to occur with considerable frequency. There was a very high mortality in the cases of broncho-pneumonia and in nearly all the fatal cases empyema developed. The mortality among the cases of uncomplicated lobar pneumonia was low, also the incidence of empyema among these cases was low. No particularly new information was obtained concerning the nature of measles nor was any opportunity afforded to study what anatomic changes measles alone produces. There occur, however, conjunctivitis and laryngitis, which appear to predispose to infection of the respiratory tract. The streptococcus infections were found, nevertheless, in individuals without a previous attack of measles. The anatomic lesion associated with the streptococcus infection was found to be an interstitial broncho-pneumonia, characterized in its gross appearance by prominent gray, solid, peribronchial nodules surrounded by edema, hemorrhage, organization and induration. Microscopically, there was marked infiltration of the bronchial wall with masses of mononuclear cells. The lumen of the bronchus was filled with an exudation of leucocytes and a few chains of streptococci. The walls of the alveoli were thickened and infiltrated.

One very important fact in connection with the development of broncho-pneumonia during measles was brought out. As the men were brought to the wards with measles, many did not show a hemolytic streptococcus in the mouth flora. If, however, there were cases in the wards with a hemolytic streptococcus pneumonia or individuals with this organism in their mouth flora, the hemolytic streptococcus was soon found to be in the mouths of a large number of the patients. Furthermore, the incidence of a complicating broncho-pneumonia was very high in such wards. This led to strict isolation by screening off of all cases of pneumonia and streptococcus carriers, with a most gratifying decrease in the pneumonia incidence and a lessened mortality.

Considerable interest and work have been stimulated as a result of the occurrence of the streptococcus in the camps. One significant publication has appeared from Baltimore (Clark and Felton, *ibid.*, lxxi, 1048). These authors found that when hemolytic streptococci are grown in rabbits' blood diluted with Locke's solution, the filtrate is toxic for rabbits occasionally in doses as low as 0.5 cc. per kilogram. The toxic material is dependent upon the presence of hemoglobin, is destroyed by heating at 50° C. for 30 minutes, is dialysable, nonhemolytic *in vivo* and *in vitro*, and loses its toxicity on standing at icebox temperature. Furthermore, it was found to require a certain incubation period in the animal before exerting its toxic effects and that an immunity can be rapidly established against it. Rabbits immune against the toxic substance are resistant to living streptococci. (See also *Pathology and Bacteriology, supra.*)

Empyema.—One of the serious features of the hemolytic streptococcus pneumonias is the great frequency with which empyema develops. In the streptococcus cases the empyema develops early and with amazing rapidity. Operation with drainage as soon as discovered, while the patient is desperately ill owing to the lung involvement, results in death in a very large number of cases. It has been shown by an empyema commission at Camp Lee that by frequent aspirations of the fluid in these cases and delayed operation until the exudate, which is usually thin if the streptococcus be the cause, has become frank, creamy pus and the lung process is subsiding, the high mortality is very markedly reduced (*ibid.*, 366, 443). From the studies of this commission the pleuritic process in the early stages seems far less important than that in the lung itself; this led to the above method in treating cases of hemolytic streptococcus empyemas. The exudate in one of the cases under observation after several aspirations became sterile, but operation was deemed advisable to facilitate rapid and satisfactory recovery. Three of the cases were not operated upon as none of them developed frank pus. The nitrogen excretion is markedly increased during the early acute stages of the streptococcus infection, amounting in certain of the cases studied to over 30 grams with a negative balance of over 20 grams. Emaciation and loss of strength are associated with this augmented protein metabolism. It may be checked, however, by raising the fuel value of the diet to a daily ration of from 3,000 to 3,500 calories. This is accomplished in practice by adding increased quantities of milk, cream, eggs, cocoa, etc., to the dietary, or by supplementing this with some readily assimilable carbohydrates, as, for example, lactose in a beverage, as is the custom in typhoid fever.

Shock.—The very distressing condition of shock following bombardment, hemorrhage and gas infection has stimulated renewed interest in the study of the condition itself and methods of treatment. Cannon has studied shock at the front in France (*ibid.*, lxx, 531, 611, 618). An acidosis, that is, a diminished supply of available alkali in the blood, was found in cases of low blood pressure due to shock, hemorrhage, and infection with the gas bacillus. As a general rule, the lower the blood pressure, the more severe the grade of acidosis. Both the pulse and respiration rates are increased in shock. The respiration rate becomes more rapid as the acidosis increases until a true "air hunger" may prevail shortly before death. Blood sugar is usually somewhat increased, hence Cannon concludes that the acidosis is not due to lack of circulating carbohydrates. Individuals suffering from shock and the associated acidosis do not undergo operation well, particularly if ether be used for the anesthetic. Nitrous oxide-oxygen anesthesia seems to be safer but not necessarily immune to disaster. Shocked men suffering after operation from extreme acidosis with "air hunger" are quickly relieved by intravenous injection of sodium bicarbonate and their blood pressure restored to normal. The author in further studies found that the blood volume of these cases of shock diminished, and proposes the term "exemia" as a better term for the condition than the word "shock". (See also *Physiology and Pharmacology, supra.*)

Irritable Heart. — Since the beginning of the war in 1914 various writers abroad have described a clinical syndrome called by Da Costa the "irritable heart of soldiers". Certain interesting and suggestive studies on the reaction of these individuals to epinephrin have been made by Peabody, Clough, Sturgis, Weaver and Tompkins at the Base Hospital, Lakewood, N. J. (*ibid.*, lxxi, 1912). The method of studying the action of epinephrin was that used by Goetsch. The subject lies quietly in bed one hour, 0.5 cc. of 1:1000 solution of epinephrin (adrenalin tablets freshly prepared) is then injected into the deltoid muscle, the blood pressure taken at frequent intervals, and the cases carefully observed clinically. As controls soldiers who had been in active military training for over two years were studied at Camp Dix. A typical positive reaction to epinephrin given under these conditions is characterized by a rise in systolic blood pressure, by increase in the pulse rate of 10 or 20 beats per minute, and by rather typical symptoms, such as flushing, sweating, increased vascular pulsation, increased tremor of the hands and often of the arms, restlessness and more or less marked general nervousness. The blood pressure may be increased by 30 to 40 mm. in certain instances. The height of reaction occurs about one-half hour after injection. It is interesting to note that the men comprising the group studied represented what may be termed the "constitutionally inferior" type of patient with "irritable heart". They were the men giving a history of being "weak", "easily exhausted", "always troubled with weak heart" and always having avoided "over-exertion", without ambition and initiative. The fundamental symptom seemed to be a tendency to become easily fatigued and most cases have been relieved from duty early in their training. Of the patients in the group of 65, 60 per cent. gave a positive epinephrin reaction, 10 per cent. gave suggestive reactions, and 30 per cent. were negative. The clinical symptoms resulting from epinephrin injections are very similar to those of which the majority of the patient group complain under the strain of training. Of the controls (27 men) there was no definitely positive and only one suggestive reaction. The basal metabolism of the susceptible individuals increased 15 to 32 per cent. in amount at the height of the reaction, falling to three to five per cent. below normal after the reaction was over. The controls, on the other hand, showed an increase of only three to 11 per cent. in metabolism falling to three to 11 per cent. below normal following the reaction. The average blood-sugar rise in seven epinephrin-sensitive cases was 0.044 per cent., as compared with a blood-sugar rise in eight epinephrin-negative cases of only 0.028 per cent. The only changes in the electrocardiograms noted was a slight decrease of the height of the T-wave occurring in one lead, usually two leads, sometimes in all three, but most marked in the second lead. In individual cases an increase of a sinus arrhythmia, inversion of the P-wave, prolongation of the P-R interval, partial heart block, inversion of the T-wave and the production of ventricular premature contractions were noted.

Asthma. — Encouragement in the successful treatment of bronchial asthma is given to the practitioner of medicine by I. C. Walker in a recent publication (*Arch. Int. Med.*, xxii, 466). Over 400 patients suffering from bronchial asthma were studied in reference to their sensitiveness (skin reaction) to various proteins. Nearly half of the patients were sensitive to some protein, the younger the individual the more frequently was he found sensitive to protein. The majority of the sensitive individuals react to protein the chief sources of which were animal hair, food, bacteria and pollens. Attempts were made in treatment to desensitize by repeated subcutaneous injections of the protein to which the subject was sensitive. The author's results are suggestive. Of the 48 patients who were sensitive to and treated with horse-dandruff protein, 63 per cent. were relieved of asthma. Partial relief was secured in 30 per cent. by diet control, and seven per cent. were considered failures. Four patients were sensitive to cat-hair protein and three of these were relieved by treatment. Seventy-three per cent. of the 30 patients sensitive to cereal grains were relieved by the omission from the diet of the grains in question. Half of the patients giving positive skin tests to other food proteins were relieved by abstaining from the offending food. These results are indeed suggestive and deserve consideration and recognition in the future treatment of one of the most distressing conditions, and at the same time one of the most difficult to control, in clinical medicine.

Aviation.—Certain interesting facts concerning the fitness of aviators for flying have been obtained by the Medical Research Board, Air Service, U. S. Army, and appear in a series of articles published in the *Journal of the American Medical Association* for October 26, 1918 (Henderson and Seibert, p. 1382; Schneider, p. 1384; Whitney, p. 1389; Dunlap, p. 1392; Wilmer and Berens, p. 1394; Lewis, p. 1398; and Paton, p. 1399). The great importance of adequate methods for selection and supervision of aviators may be appreciated when it is known that only about two per cent. of the accidents are due to bullets, eight per cent. to defective aeroplanes, and the remaining 90 per cent. to the aviator himself. The purpose of the Research Board was to study

> (1) the cause and nature of the failure, physiologic or psychologic, on the part of the pilot which precedes a fall; (2) the development of a method for determining the maximum altitude to which each individual pilot can ascend without danger of such failure; (3) the development of forms of physical training increasing the resistance of the pilot to the ill effects of altitude, and maintaining him in a state of perfect physical condition; and (4) a deeper knowledge of the nature of air staleness.

A rebreathing apparatus and steel chamber for obtaining low barometric pressures in order to simulate as closely as may be the high altitude conditions met in aviation, were devised. It was very definitely shown that observation of the character of the breathing, the heart rate, the blood pressure and coördinating ability were valuable aids in selecting and grading the men. During the rebreathing periods, as the oxygen tension is reduced to that corresponding to an altitude of from 18,000 to 25,000 ft., the good men increase the rate of breathing only slightly but increase the depth—the volume per minute increased from 8.5 litres at sea level to 14 liters per minute at 25,000 ft. Men whose breathing is shallow and rapid do not tolerate low oxygen tension well. The heart rate was also found a trustworthy indicator of oxygen want. In a few of the good men the pulse quickens at 5,000 ft. but the marked increase in pulse rate occurs between 13 and nine per cent. oxygen. An increase of 40-50 beats constitutes a good reaction. The men in whom the pulse rate becomes very slow or very rapid in a low oxygen tension do not make good or safe aviators. In the Grade A men there is a rise of from 15 to 20 mm. in the systolic blood pressure during the reduction of the oxygen from 14 to nine per cent. An increase of 40 to 60 mm. or a sudden fall in the blood pressure is of bad omen. Experiments conducted in the low-pressure chamber have shown that there may be considerable dilatation of the heart, as shown by careful percussion, also that certain heart murmurs (mitral stenosis) may be brought out. This method of testing cardiac function is suggested as of value in civil life. The power of coördinating was tested by a very ingenious device in which the operator had three manipulations to perform simultaneously: (1) a stimulus light is lighted by the examiner, whereupon the subject must touch with a stylus in the right hand a "button" so arranged that if properly performed a green lamp is lighted but if through unsteadiness the stylus touches the washer surrounding the button, a red lamp lights; (2) control the speed of a motor with a pedal clutch; and (3) control an ammeter. Control in the good men is well maintained up to nearly the lowest oxygen tension they can endure without fainting. Low oxygen tension was found to affect ocular function. Confused stereoscopic vision, contraction of the fields of vision and decreased power of convergence occur at high altitude and all are relieved by supplying oxygen. The hearing and motion-sensing apparatus of the ear seem to be little affected by the oxygen tensions attained in the experiments.

The importance of careful medical supervision was repeatedly shown by testing the men in different physical states. One subject had demonstrated his ability to fly to an altitude of 23,000 ft. without difficulty, but on a later day, following a good dinner of the evening before, he was able to attain a height of only 18,000 ft.

SURGERY

M. G. Seelig

War Surgery.—In view of the fact that the flower of surgical thought and endeavor has been devoted for four years to the principles and facts of war surgery, it is both natural and logical that any short, condensed *résumé* of the surgical year should be devoted exclusively to the military side of the science. Despite the intensive effort directed toward mastering the surgical disasters of war, one must always keep in mind that in the broad, general sense of the word, war surgery differs in no essential regard from civil surgery. No surgical principles that might be characterized as fundamental have been developed; the old principles have merely been modified so as to meet the altered conditions incident to the terrain of battle, to the necessity of transport of the wounded, and to the exigencies of warfare in general. All this it is important to bear in mind as a fundamental fact in any consideration of "war" surgery, unhappily interpreted in many quarters as a branch of surgery apart, governed by laws and principles that have developed recently, Minerva-like out of the head of Jove.

Wound Infection.—By way of illustrating what is said above, it may be pointed out that the two fundamental subjects of wound infections and wound treatment stand about as they did before the war, modified only incidentally. Among wound infections, the three groups that have come in for the largest consideration are the ordinary pyogenic wound infections, infections due to gas-producing organisms, and infections due to tetanus.

A study of the pyogenic infections has developed nothing essentially new in principle. Gas gangrene, on the other hand, as a result of very intensive study both abroad and in America, has furnished much material that might be conservatively described as new subject matter. In the first place, we realize more clearly than before that gas infections are traceable to more than one source. *B. aerogenes capsulatus, B. oedematis maligni* (*Vibrion septique*), *B. protus vulgarus, B. sporogenes, B. oedematiens, B. fallax, B. histolyticus, B. Hibler* IX, *B. Ghon-Sachs* II, have all been recognized as gas-producing organisms. The importance of a broad, general concept of this sort (*i.e.*, of multiplicity of organisms responsible for gas formation) will be readily appreciated when we come to develop effective therapy for treating this type of infection.

Further additional facts of importance that have developed on the subject of gas gangrene may be stated in brief to be: (1) the prominent *rôle* played by the infection as a severe, life-threatening complication; (2) the rather pronounced tendency of the gas organisms to remain dormant in the tissues, only to be stirred into activity by secondary operation, or some other late surgical factor; (3) the almost universal frequency with which the gas organism occurs in combination with the pyogenic organisms and the striking clinical facts that result from the presence of streptococcus; (4) the rather doubtful outlook for the development of a potent therapeutic serum as contrasted with the rather hopeful outlook for a prophylactic serum; and (5) the relation of gas infection to the primary closure of war wounds. Of these topics only two or three require special comment. The phenomenon of symbiosis is important, owing to the fact that a careful study of the clinical course of wound infections has shown that either the streptococcus or the gas organisms alone may be regarded as fairly innocuous when it is possible to excise a wound 12 hours after its reception, but when both these organisms are present, the clinical course is treacherously dangerous and the surgical indications are modified. This can best be illustrated by quoting the four laws of Vaucher:

> 1. When cultures from a wound are completely sterile, the wound may be closed with perfect security.
> 2. When cultures from a wound show only the common pyogenic organisms, the wound may be closed with perfect security.
> 3. When cultures from a wound show gas-producing organisms, either in pure culture or associated with the common pyogenic organisms, *other than strepto-*

coccus, the wound may be closed with caution, provided the general condition of the patient is good, and he is carefully watched.

4. When a culture of a wound reveals the presence of pure streptococcus with gas-producing organisms, the wound must not be closed.

Under the head of treament for gas gangrene, little is to be added to the facts that have been developed previously in civil surgery. When life is not threatened and the clinical course of the disease remains within bounds, free incision, paying particular attention to the incision of muscle sheaths, is all that is necessary. When the infection has got out of bounds and is no longer amenable to conservative surgery, amputation is in order. The above reference to the incision of muscle sheaths is important, because the gas organisms have an elective affinity for muscle; and as they develop gas within the muscle, an intrasheath tension develops and leads both to early gangrene and to a rapid "driving in" of the infection. The incision of the muscle sheath (sometimes referred to as "allowing the muscle to breathe") frequently produces strikingly beneficial therapeutic results.

Serum treatment unfortunately has not accomplished what seemed to be promised by animal experimentation. The reason for this failure has been already noted. At the present time, however, it is said that the outlook is hopeful for the use of a polyvalent serum as a *prophylactic* injection. The horses that furnish tetanus antitoxin are being inoculated with gas organisms, so as to furnish a serum both anti-gas and anti-tetanic in its action.

Tetanus.—The so-called "war facts" pertaining to tetanus were carefully considered at the January, 1918, meeting of the Research Society of the American Red Cross in France (*Red Cross Medical Bulletin* No. 4, 1918). They may be stated categorically as follows:

1. For simple wounds, a prophylactic injection of 500 cc. of serum is sufficient; but for large, deep and heavily contaminated wounds, 1,000 to 1,500 units is necessary.
2. All cases of trench foot (see *infra*), even the mild cases without obvious skin lesions, should receive a prophylactic injection.
3. In lesser injuries, two injections should be given at seven- and eight-day intervals; in graver injuries with prolonged suppuration, three to four prophylactic injections should be given at seven- to eight-day intervals.
4. In cases requiring secondary delayed operation, a prophylactic injection should be given before undertaking the operation.
5. There are four possible routes by which the serum may be administered: (*a*) subcutaneous, (*b*) intravenous, (*c*) intramuscular, and (*d*) intraspinal. No one attaches much importance to the intraneural route. The French observers seem inclined to give preference to the subcutaneous and intramuscular routes, whereas the English prefer repeated injections by the intraspinal routes.
6. On the question of dosage for active treatment (*i.e.*, to combat the disease after symptoms are well established) there is much diversity of opinion. On a few points, however, there is fairly general agreement: treatment must be administered early, the dosage must be high, treatment must be continued well along into convalescence.
7. Careful wound excision is in itself a very powerful prophylactic factor in combating tetanus.
8. The old established clinical fact is confirmed that the severity of clinical symptoms is in inverse proportion to the length of the incubation period of the disease—the shorter the incubation period, the more severe the attack.
9. Methods of treatment other than the use of serum have been confined to the use of chloral, bromides and morphine. Col. Sir William Leishman states that both carbolic acid and magnesium sulphate have fallen into disuse as antitetanic drugs.

Wound Treatment.—Probably the most fundamental problem of war surgery is that of wound treatment. Even those who are only cursorily acquainted with the progress of war surgery are conscious of the steadily manifest evolution that has been maintained in this field. Sir Anthony Bowlby (*Brit. Med. Jour.*, March 23, 1918) furnishes an admirably succinct *résumé* of the development of the modern treatment of war wounds, from which we quote freely in all that follows.

Soon after the commencement of the war, surgeons were brought in contact with a terribly septic condition of the wounds, and extensive prevalence of spreading gangrene, due to pyogenic wound infection. The remedies advocated fell into two classes: first, strong antiseptics, which it was believed were capable of arresting sepsis if applied early enough and strong enough; second, the acceptance of the fact that antiseptics were of no use, and that no treatment could possibly so antagonize the innumerable bacteria as to permit of the early closure of contaminated wounds, which therefore must be left as widely open as possible, and encouraged to discharge. No one at that time was in a position to dictate to others the answer to the questions: What is the best method of combating the all-prevailing sepsis? and How can wounds be got to heal quickly and safely?

As time went on, things became clear that had long been obscure, and it was gradually recognized that too much power for evil had been attributed to the microbic invasion; that the infection had been too gross to be combated by antiseptics; and that the source of the danger was to be sought for in the damaged or dead tissues contaminated by the mud of the manured fields, in the portions of the muddy clothing and in the missiles that had been buried in the wounds. At first it was deemed sufficient to open up wounds and to remove missiles, but as soon as a little more knowledge was acquired, surgeons began to excise the damaged tissues, at first very sparingly, but more and more attention was paid to the complete removal of as much as seemed likely to prove a dangerous center of infection. Today we know that the one and most necessary method of treatment is the careful and thorough mechanical cleansing of the wound and the complete removal of all dead or partially devitalized tissue. Without this antiseptics are useless, and, in proportion as technique is good, and excision can be done early and can be really complete, antiseptics applied inside the wound are merely accessory. The one condition for success is that this complete surgical cleansing must be performed before the bacteria have had time to penetrate too deeply or to spread too far, but of this there is more to be said later.

In the early days of the war, no cases did worse than those in which the surgeon had completely sutured the wound, and the experience of many surgical disasters prevented any return to such treatment for a very long time. The consequence was that after an operation of excision the wound was habitually left open, and only after a disinfecting process, such as that provided by the ingenuity of Carrel, was any attempt made to close the wound by secondary suture.

It is interesting to note how the systematic treatment by primary suture began with the knee joint, and how it has grown. Early in the war, wounds of the knee joint were very commonly followed by suppuration of the most severe and dangerous kind, and this although many surgeons in France knew the danger of drainage tubes in the articulation and avoided it. But it was soon realized that many perforating wounds of joints did well, even although the synovial fluid was infected, if only they were not opened up and drained, and the natural conclusion was that if the wounded joint could be closed, after the removal of missiles, and after thorough surgical cleansing, it might also do well. As soon as this practice became common, not only did many of the joints not suppurate, but the skin wounds also healed by first intention in a very large proportion of all the cases, and it was found that the surgical ideal of a healed aseptic wound had been attained.

Very cautiously, the practice of primary suture was applied to other wounds, and nowhere was it of greater value than in wounds of the brain and fractures of the skull. Injuries which had been treated in the early days by drainage with bad results were now treated by surgical excision and primary suture of the scalp with infinitely better results. Wounds of the abdomen were treated on the same lines, and the abdominal wall was closed after operations on the intestines or other viscera.

To this was added the impossibility of excising large vessels and nerves exposed in a wound, and the consequent imperfection of the excision operation. In cases of extensive fracture and comminution of dirty bone, the task was still more difficult when the surgeon endeavored to make sure of reaching every portion of the damaged area. No doubt the great majority of the failures were the result of the very natural unwillingness to excise enough of the damaged muscle, but experience, surely though slowly, taught the necessary lessons, and by the exercise of a scrupulous asepsis combined with a meticulously careful surgical technique, more and more successes were attained, and wounds were closed which a few months earlier would have been considered quite beyond the possibility of suture.

The year 1917 saw a general acceptance of the proposition that union after primary suture was, under favorable conditions, a reliable surgical fact, and the opinion of surgeons on the treatment of wounds was altogether different in December from what it had been in January. There developed rapidly a general consensus of opinion that the time had come to try the primary suture of wounds on a larger scale, and in both the British and French armies, as well as in the Belgian, many surgeons whose hospitals were favorably situated took the matter up. A large hospital with fine wards on the pavilion system was occupied in July by both British and French units, and, working in close touch with each other, the surgeons of both nations proceeded with similar investigations. The circumstances were favorable, for wounded could be brought in quickly, could be accommodated under excellent conditions, and could be retained for an indefinite time, so that it was easy to follow wounds to the end of their surgical course.

Sufficient care has now been exercised, and sufficient experience gained, to allow the primary suture of wounds to be placed on a definite footing, and to permit the following conclusions to be drawn:

1. The most important treatment is the careful cleansing of every part of the wound, and the subsequent complete excision of all dead, badly damaged or grossly infected tissue. It is never necessary or right to remove more than a very thin edge of skin.
2. Complete asepsis is of the highest importance, and experience at the front is essential in order to select suitable cases.
3. The wound may be sutured at once, or may be left unclosed for one, two, three or four days. It can then be sutured, with results which are identical with those obtained by immediate suture.
4. If after operation the wound is not sutured, it should be dressed in such a way that it need not be disturbed till the time for closure has come.
5. If the wound is sutured at the time of operation, the patient should be retained in hospital for not less than a week. If he cannot be retained, then the wound must not be sutured.
6. It is seldom that even after the most careful operation, the wound is sterile, and bacteria can generally be found in the secretion on the following day. The presence of a few bacteria, whether anaerobes or the ordinary pyogenic forms, does not prevent healing of the wounds. Streptococci which can hæmolyze blood constitute the most dangerous form of infection, and if they are detected, the sutures should be at once removed.
7. No definite rule can be laid down as to the lapse of time after which suture should not be done, but the sooner the wound can be operated upon, the greater is the probability of success. It can be sutured later.
8. If the wound edges are found on examination to be already indurated and inflamed, or if definite gas gangrene has already commenced, the wound must not be closed. Whenever there is any doubt at all it is best to leave the wound open, knowing that it can be equally well sutured in a day or two if this appears advisable.
9. A wound that is frankly suppurative should be sterilized by one of the approved methods of chemical sterilization. Of these methods, that of Carrel-Dakin is at present most popular.

Trench Foot.—The disease known as trench foot has been one of the most serious of the disabilities essentially linked with warfare. The latest authentic data covering this subject was furnished in the discussions of the Fourth Interallied Surgical Conference held in France, March 11-16, 1918, and summarized in the *Review of War Surgery and Medicine*, September, 1918, as follows:

1. Trench foot is a pathological condition provoked by moist cold and complicated as a rule by secondary infection.
2. The disorder presents four stages, as follows: (1) painful anesthesia; (2) edema; (3) phlyctenules; (4) sloughing. Three clinical forms may be described: (*a*) Slight (85 to 90 per cent. of the cases), characterized by painful anesthesia, edema and redness; (*b*) moderate (13 to 14 per cent.), characterized by phlyctenules and limited sloughs: (*c*) severe (one per cent. on an average), characterized by extension of sloughing and the appearance of septicemic complication. This form may produce serious mutilation or death.
3. Trench foot, especially the more serious forms, is not infrequently complicated by tetanus or gas gangrene, and relapses and recurrences may take place. Trench foot occurs almost exclusively

in soldiers who live in the trenches, more particularly, in certain trenches. Soldiers coming from hot countries, dark-skinned races particularly, are more frequently attacked than Europeans.

4. Blood stasis, due to prolonged standing, to long immobility and to a bad attitude, compression of the leg and interference with the venous circulation, particularly by puttees, and more especially remaining long in cold and damp, are the principal causes of trench foot.

5. Trench foot may be confused with true frostbite and with chilblains. True frostbite is characterized by sudden massive mortification of a part of a limb (the front of the foot, the whole foot, etc.); trench foot, on the contrary, is characterized by limited destruction (gangrenous patches on the dorsum of the foot, the sole or the toes), and by progressive invasion of the tissues of the foot. Frostbite is met with in severe, dry cold, especially in mountainous regions. Trench foot occurs only in damp weather and at low altitudes (valleys, plains); it disappears in frost. Chilblains are characterized—at any rate in their early stage—by very severe itching, whereas those forms of trench foot which are liable to be confused with chilblains—that is to say, the slight forms—produce painful anesthesia without any itching. It has to be admitted, however, that sometimes the diagnosis between ulcerated chilblains and the ulcerated phlyctenules of trench foot may be doubtful.

6. The treatment of trench foot is preventive and curative. Preventive treatment energetically applied and supervised may be followed by the disappearance of cases of trench foot, or may at least render them very rare. The treatment includes (*a*) collective measures: hygiene and draining of the trenches, gratings, trench boots, dry, warmed shelters, with, if necessary, frequent reliefs; and (*b*) individual preventive precautions taken daily: drying, cleansing and massage of the feet, change of socks in the shelters, supervision of the puttees and of everything that can cause compression of the lower limbs. Belgian medical officers attribute the extreme rarity of cases of trench foot in their army to the disuse of puttees. The curative treatment of trench foot includes the following measures:

(*a*) Slight cases. A warm foot bath should be taken every two or three days and the feet washed with boric camphor soap. A large moist boric camphor dressing should be applied to the foot every day.

(*b*) Severe cases. When phlyctenules only are present they should be opened and touched with camphorated ether, and a moist boric camphor dressing applied. Sloughs should not be removed with the knife; they should only be scarified, without causing bleeding, so that the drugs used may act on the subjacent tissues. Spontaneous separation must be awaited, and complications carefully watched and thoroughly treated surgically and fully at their onset. The principle by which operation ought to be guided is that it should be late and confined to the rectification of stumps which are defective from a functional point of view. Amputation should be performed only in cases in which the surgeon's hand is forced by serious general complication. In every case preventive antitetanic treatment should be used (injection of antitetanic serum repeated every week until the wound is cicatrized).

PUBLIC HEALTH AND HYGIENE

David Greenberg

Influenza.—It is too early to say anything definite concerning the pandemic of (so-called) Spanish influenza which swept over the United States during September and October of 1918, but it is hoped that before long the numerous investigations which are now under way in all parts of the country will throw light upon the nature of the disease, its transmission and prevention (see also XIII, *Life Insurance*). The best article which has thus far appeared describes the pandemic in the Army camps (G. A. Soper, *Jour. Am. Med. Assoc.*, Dec. 7, 1918). During the period from Sept. 12 to Nov. 1, 1918, there were 306,719 cases of influenza reported among the troops in America. During the same period there were 48,079 cases of pneumonia and 19,429 deaths. If the total strength of troops be taken at 1,500,000, approximately one in every five had influenza; of these about one in six developed pneumonia, and of the pneumonia patients about two out of five died. The first report that an epidemic existed came on Sept. 16 from Camp Devens at Ayer, Mass. The progress of the disease was carefully watched from day to day by the Surgeon-General's Office, and the records show that influenza occurred as an explosion, with the maximum effect produced 10 days after the onset, the duration being less than three weeks in many instances. In general the pandemic spread from the Atlantic seaboard inland, and from the Northeast to the West and South. There is no reason to suppose that it traveled more rapidly than persons could travel.

As to the means of its transmission, it is clear that the disease is carried from place to place by persons and not things. Its rapidity of spread is due to its great infectivity, short period of incubation, missed cases, and absence of timely precautionary measures. It is probably true that the disease has been taken into camps, from camp to camp, from camps to towns, and towns to towns, by people. The travel and mingling that occur in ordinary circumstances seem to account for these facts. Concerning the causative agent there is much doubt. Up to this year the infective agent of influenza was held to be the Pfeiffer bacillus, but the experience gained from this pandemic does not point to this organism as the etiological factor (see also *Pathology and Bacteriology*, and *Medicine*, *supra*). It is interesting to note the steps taken by the Surgeon-General's Office in the handling of the pandemic; these may be described under three heads: (1) isolation, (2) sanitation, and (3) education. Under isolation procedures were taken by which the infected could be separated from the well. Under sanitation are included such steps as the cleaning and airing of barracks, the boiling of mess kits, and other procedures.

The effect of barrack life upon the prevalence of respiratory disease with particular reference to influenza was investigated by Heiser (*ibid.*). He notes that the mortality rate among soldiers in cantonments and among students in barracks at colleges (Students' Army Training Corps) was much higher than the mortality rate among civilians. For instance, the mortality rate per thousand among civilians (same age groups as those men in the Army) was 8.8 in Philadelphia, 7.5 in Boston, 4.2 in New York, and 1.1 in Milwaukee, while in the Army it was 11.0. Even among the members of the Students' Army Training Corps, the more nearly the mode of living approached the customary pre-war conditions, the more nearly did the death rate correspond to that of the towns in which they were located. The conclusion is reached that the conditions prevailing in barracks which lead to the higher death rates are the crowding, the probable infection through close contact at meals, and hand infections.

Pneumonia.—A matter of extreme importance in the treatment of pneumonia is a knowledge of the type of pneumococcus concerned in the production of the disease. A method for the determination of the type, in general use until a short time ago, was that of mouse inoculation. Forty-eight hours, however, was required for this procedure. The scarcity of white mice and the comparatively long time required by this method have led to the formulation of two other methods of value.

The first of these (Avery, *ibid.*, Jan. 5, 1918) is dependent upon the fact that the addition of carbohydrates and of blood proteins to suitable media greatly accelerates the initial growth of the pneumococcus, and secondly that bile causes solution of the pneumococcus and has no lytic action on other bacteria. In this method the specimen of sputum is washed, inoculated into a tube of glucose blood broth, and incubated, the red blood cells are removed by centrifugation and the supernatant bacterial suspension added to sterile ox bile and allowed to stand until solution of the pneumococcus bodies takes place. Portions of this bile solution are now added to the different types of immune sera, and the formation of a precipitate with one of these determines the type of pneumococcus in the original sample of sputum. Another very rapid method for the determination of the type of pneumococcus has been devised by Krumwiede and Valentine (*ibid.*, Feb. 23, 1918). The specimen of sputum is coagulated in boiling water. Saline solution is added and the tube is again placed in boiling water to extract the soluble antigens. The supernatant liquid after centrifugation is used with the immune sera, the positive reaction being evidenced by a definite contact ring in the tube containing the homologous serum. It is hoped that the rapid methods for the type determination will so aid in the making of an early diagnosis that the mortality rate from pneumonia may be considerably reduced.

Studies have definitely established

the existence of the carrier state among healthy persons and those recently recovered from the disease. The seat of infection is in the respiratory passages and throat. In a valuable contribution on this phase of the question Kolmer and Steinfeld (*Jour. Inf. Dis.*, March, 1918) arrive at the conclusion that ethylhydrocuprein hydrochlorid, quinine bisulphate and other cinchona compounds in liquor thymolis have a high destructive activity for types I and IV pneumococci in the sputum of convalescents from lobar pneumonia and the mouth secretions of normal persons. It is therefore highly advisable, in order to assist in the prevention of the spread of pneumonia, for the patient and those in contact with the patient to use systematically a mouth wash of 1:10,000 solution of ethylhydrocuprein hydrochloride in liquor thymolis. The isolation of patients and suspects and also carriers at the earliest possible moment is also of assistance in the prevention of the spread of the disease.

A method which is looked upon as being one of the most fruitful in the prevention of pneumonia is that of inoculation (see also *Medicine, supra*). During the winter of 1917-18, 12,000 soldiers at Camp Upton were inoculated with anti-pneumococcus vaccine, and during their several months' stay at the camp previous to their departure for France, not a case of pneumonia due to the types of organism used for inoculation developed, while amongst the men not so inoculated there occurred a considerable number of cases (Cole, *Jour. Am. Med. Assoc.*, Aug. 24, 1918). In summarizing it may be said that this method seems to hold very promising results for the future.

Venereal Disease.—Until the time of the entrance of the United States into the war very little, if anything, was done to control venereal disease, and because of the fact that very meagre statistical knowledge was at hand, the extent of the ravages of these diseases was not fully realized. With our entrance into the war, however, and the consequent examination of thousands of men for service, the facts began to stand out clearly and call attention to the prevalence of these diseases and the gravity of the situation.

Surgeon-General Gorgas, in an address before the American Public Health Association (*Am. Jour. Pub. Health*, Feb., 1918), speaking of the problem of venereal disease and the war, said:

> It is the greatest cause of disability in the army. The army loses more days of service from its men due to venereal diseases than from any other cause. We, in the course of the year, would be able to keep more men in the trenches and have a more efficient force by having eradicated venereal diseases than by eradicating wounds.

The venereal-disease problem in the army is not by any means limited to the disease contracted by men in the service, but because of cases contracted before enlistment, the problem is closely interwoven with the problem in civil life.

In a paper entitled "Venereal Disease Control in the Army" (*Jour. Am. Med. Assoc.*, Aug. 10, 1918) the following statistics are brought forward as showing the amount of venereal disease contracted before and after entrance into the army. The annual rates per thousand men, before enlistment, at five National Army camps were, for gonorrhea, 231.3; for syphilis, 53.5; for chancroid, 30; and after enlistment, for gonorrhea, 11; for syphilis, 1.8; for chancroid, 4.0. Of the total amount of venereal disease in the army, five-sixths is contracted in civil life, and only one-sixth contracted after entrance into the service.

The measures for the control of venereal disease in the army, brought into play both in camp and in the surrounding communities, have been educational, preventative, prophylactic and disciplinary (Snow and Sawyer, *ibid.*). Due to the fact that our army grew to be so large and that every one was deeply concerned in the soldier's welfare, most communities responded to the requests of the Army for assistance in safeguarding the soldier's health. In the camps the educational method was used to great effect, by lectures, talks, motion-picture films, exhibits and pamphlets; the soldier was presented with a strong appeal to keep himself morally clean. Through clean sport and entertainment the soldier has been protected in his unoccupied time (see also XIV, *Recreation*). If a man has been exposed, he is instructed to report for prophylactic treatment immediately on his return to camp and in some instances special prophylactic stations are maintained in cities frequently visited by the men. For failure to report, the men understand that they are liable to court martial and loss of pay for the duration of their disablement from venereal disease. Lastly, all soldiers are inspected at least twice monthly for venereal disease.

Country-wide efforts for the control of these diseases among the civilian population were made necessary because of the fact that comparatively few communities are extra-cantonment and the soldier is in need of protection no matter where he is. The War Department Commission on Training Camp Activities undertook a most active campaign for the suppression of bootlegging and prostitution. A corps of 26 officers of the Law Enforcement Division of the War Department Commission on Training Camp Activities are engaged in combating venereal disease and vice by stimulating the enforcement of state and Federal laws, and by this means over 80 red-light districts have been abolished. That these methods have proved successful is shown by the fact that our armies now have the lowest venereal-disease rate of any army in the field, and for weeks the rate of the expeditionary forces has been only about half that formerly averaged by our Regular Army. The rate has dropped from 155 cases per 1,000 in 1910 to approximately 20 per 1,000 in 1918. (*Social Hygiene Bull.*, Sept., 1918.)

The extent of the venereal-disease problem among the civilian population is practically unknown. In a communication to the American Association for Study and Prevention of Infant Mortality (Oct., 1917) the following estimate based on the examination of large numbers of men from different localities is reported. The percentage of positive Wassermann reactions found (an indication of the existence of syphilis) varied from 0.0 to 5.0 per cent. among students, 8.0 to 10 per cent. among working men, 16 to 18 per cent. among recruits to the Regular Army (before the war), and 20 to 24 per cent. among negro workmen. It is to be noted that these figures are for syphilis alone and do not include gonorrhea, which is considerably more prevalent.

Fully cognizant of the extent and seriousness of the problem of venereal diseases the Federal authorities have arranged a national programme for their control of farreaching importance. Under an act promulgated by the Secretary of the Treasury $1,000,000 has been set aside to be distributed among the states for the use of boards of health in the prevention, control and treatment of venereal disease (*Public Health Reports*, Sept. 13, 1918). In accepting allotments of this fund the state board must put into force laws or regulations embracing certain requirements, the more important of which are the operation of bureaus of venereal disease whose chief duties will be the securing of reports of venereal infections from physicians; suppressive measures, including isolation and detention; the extension of facilities for early diagnosis and treatment; and the limitation of the activities of advertising quacks or "specialists."

In addition the Public Health Service has formulated an extensive programme by which it proposes to render assistance in the control of these diseases. Under medical measures it includes establishment of clinics, dispensaries, and hospitals; epidemiological studies; free diagnosis; examination for release as non-infective; free distribution of arsphenamine; and control of carriers through detention and commitment. Under the educational side of the programme are included: proper reporting of cases; standardization of exhibits; coöperation with other authorities and associations; coöperation in shipyards and industrial plants; and coöperation with druggists' organizations in control of patent nostrums.

The efforts of the public-health authorities are fast bearing fruit. Thirty-seven states now have laws which require notification of venereal disease and are rapidly supplementing this with the necessary educational and medical measures (*Public Health Reports*, June 28, 1918). (See also XIV, *Social Hygiene.*)

Tuberculosis.—If tuberculosis in a community is to be properly controlled, obviously the first essential is to know the extent of the disease and to locate the cases. This information is as a rule obtained from the reports of physicians, but the best method by far is to make a house-to-house inspection to disclose the cases. Chicago has been the first large city to attempt this procedure, and as a result has obtained some very interesting and valuable information (*Am. Jour. Public Health*, April, 1918, p. 277). It was found that the number of registered cases of tuberculosis was less than the number of deaths from this disease, and that only four per cent. of the existing cases had been reported to the Health Department. The total number of persons examined was 165,700, and of this number 8.6 per cent. were found tuberculous. The cases on record and their location cast considerable light on the economic distribution of the disease; in another direction it is quite illuminating, namely, as showing the high incidence of the disease among food and candy purveyors, and showing also the difference in incidence among the different nationalities represented.

The survey has brought forth two important results: first, Chicago has found out just where to establish dispensaries; and second, the conclusion has been reached that a tuberculous person who continually refuses to live in a hygienic manner and subjects others to the chance of infection should be transported to a municipal sanatorium and be kept there until he learns to do so. The powers possessed by the commissioner of health give him the same right to do this as to hospitalize a case of smallpox.

After the completion of the survey for the purpose of determining the amount of tuberculosis, it was decided to make an intensive study of a number of blocks to ascertain whether any relation could be shown between housing and tuberculosis (Chicago Municipal Sanitarium, Annual Report, 1917). Twenty-two blocks were examined, situated in the area covered by the tuberculosis survey, and included 1,100 houses, 3,800 apartments, and 15,100 rooms with a population of 15,500. The study has many new features which in previous investigations were not reported. The relation of housing to tuberculosis was studied from many different angles—the classification of rooms according to the amount of natural light, according to size of rooms, number of rooms, degree of crowding, and length of residence in any apartment. This carefully conducted study shows no direct relation between the amount of tuberculosis found and any of the conditions that strictly pertain to housing. There is nothing to show that the largest incidence of tuberculosis exists in the worst rooms, apartments or blocks.

At the present time there is very little information to guide us in determining whether or not tuberculosis sanatoria are really worth while. The most recent analysis of the condition of patients discharged from sanatoria was made by Billings and Hawes (*Am. Rev. Tuberculosis*, Jan., 1918). They found that on the first visit to the patients in their homes within three months after discharge, 28 per cent. were in good condition, 50 per cent. living, 11 per cent. dead, and nine per cent. unaccounted for. After a period of from two to four years after discharge, they found 29 per cent. of their former patients in good condition and at work, 11 per cent. living, 45 per cent. dead, and 13 per cent. unaccounted for. The authors conclude that the earlier the diagnosis is made, the more favorable the outlook, and the fact that the disease is moderately advanced or advanced ought not to discourage us, nor does it necessarily mean an unfavorable prognosis. While it is true that favorable results can be obtained with incipient cases, the latter part of their conclusion is not borne out by the facts presented. Their analyses show that of the cases visited two to four years after discharge from the sanatorium, about half the number were dead. Such results do not speak very favorably for the sanatorium as a place for all types of tuberculous patients.

Diphtheria.—The presence of diphtheria in civilized communities constitutes an important hygienic problem, and the need for a practical and efficient method of immunization that will protect the individual is great. Such protection should be applied early in life, so that an immunity will be produced during that period when individuals are most susceptible to the disease, namely, from the first to the sixth year of life. Investigations on diphtheria protection, using a toxin-antitoxin for immunization, have been carried on at the laboratories of the New York City Department of Health (A. Zingher, *Am. Jour. Dis. Children*, xvi, Aug., 1918) with fair success. An active immunity has been produced in from 95 to 100 per cent. of susceptible individuals. This immunity is shown by the fact that during subsequent exposure to the disease, the children (immunized) remained free from diphtheria. Furthermore, the immunity has been found to last, now, over three years, and in a small group over four years. These results are very striking and hold great promise for the future.

The diphtheria carrier is a potential source of infection, and the protection of the community against this source has taxed the energies of health authorities. Various procedures have been suggested and tested to rid the carrier of the diphtheria bacilli—spraying with the staphylococcus or other organisms, the insufflation of desiccated diphtheria antitoxin, spraying with kaolin, ferric chloride, various antiseptics, and other measures, but with little success. It has been noted by McCord, Friedlander and Walker (*Jour. Am. Med. Assoc.*, July 27, 1918) that the use of any materials, however efficacious, will not remove the diphtheria organisms except on the surface of the tonsils and throat. Cultures from the interior of excised tonsils of diphtheria carriers repeatedly have exhibited viable diphtheria bacilli when surface cultures indicated an absence of such organisms. Consequently, the method of controlling the discharge of bacilli as adopted by these men consists in thorough examination of the throat and the treatment of ulcers in the tonsillar or adenoid tissue, and in cases in which the tonsils are badly involved, their excision is the procedure of choice. In addition, a systematic treatment with chloramin-T (used as a gargle) was inaugurated. Through the use of these procedures it has been possible to release carriers after a stay of 16 days at the hospital, whereas before this systematic treatment was instituted they were not ready to be released until after a three months' stay.

Malaria.—Practical demonstrations of malaria control through anti-mosquito measures have been repeatedly made by the U. S. Public Health Service, and in every instance concrete results in the saving of life and the prevention of unnecessary illness obtained. One of these demonstrations, made at Crossett, Ark., is worthy of note (*Public Health Reports*, July 12, 1918). The measures for combating the mosquito include clearing and draining of streams and ditches, oiling, filling in low-lying land, and control of artificial containers. As to the results obtained, it was noted that the reduction in malaria as shown by the decrease in the number of professional visits for the disease in 1916 and 1917 was 92 per cent. As regards the cost of maintaining this control, the amount for 1916 was $1.23 and that for 1917, $0.63, *per capita*.

Nutrition. — The year has seen marked progress in practical and scientific nutrition in America. The deficiency diseases have been extensively studied (see also XXIII, *Biological and Food Chemistry*). In the Army a Nutrition Division was organized to study the proper rationing of soldiers, and succeeded in eliminating great food waste as well as improving the quality of the messes. In civil life the U. S. Food Administration, under a voluntary system of food rationing, succeeded in saving enough food to supply our Allies and encouraged an intelligent interest in practical nutrition. Experiments undertaken by the Nutrition Laboratory of the Carnegie Institution, on a group of men, showed that when the food intake was restricted so as to cause a 10 per cent. reduction in weight, a decrease of 25 per cent. in the energy requirements of the body resulted. While there was some emaciation, no untoward effect upon the physical or mental activities was observed. The purpose of this investigation was to obtain positive evidence regarding the effect of a prolonged restriction in diet, which would be of possible use in an imminent emergency should the nation face a food shortage. (F. G. Benedict,, *Proc. Am. Philos. Soc.*, lvii, 1918, 479.)

Industrial Hygiene. — Profiting by England's experiences in the factories during the early years of war, the United States was fully awakened to the importance of industrial hygiene and sanitation. In its war programme the U. S. Public Health Service included a series of measures for the control of disease in industrial establishments. These measures include: (1) securing adequate medical and surgical supervision of employees in places of employment; (2) establishment by the Service in coöperation with the Department of Labor of minimum standards of industrial hygiene and the prevention of occupational disease; (3) improvement of the sanitation of industrial communities by officers of the Service; (4) Medical and sanitary supervision by the Service of civil industrial establishments owned or operated by the Federal Government; and (5) establishment wherever practicable of dispensaries and hospital facilities for U. S. Government employees. (*Public Health Reports*, Sept. 27, 1918.)

Because of the necessary overtime work and the resulting production of fatigue in the factories producing munitions of war, an investigation of the factors concerned in the production of fatigue was carried out by the Divisional Committee on Industrial Hygiene of the Council of National Defense under the auspices of the U. S. Public Health Service. The report of this Committee (*Public Health Reports*, Aug. 16, 1918) enumerates the following methods of reducing industrial fatigue: (1) introduction of recess or resting periods which should be obligatory on the part of the workers; (2) the occasional introduction of a little variety into the day's work by training the operative to perform some alternative process; (3) Use of machine speeds in consonance with the worker's customary rhythm—the output then may be twice as great as with a speed a little slower or even faster than this; (4) Provision of seats adjustable to each operator's physical stature; (5) ventilation of workrooms and maintenance of sanitary conditions in and about the plant; (6) alternation of day and night shifts; (7) hours of labor properly adjusted, since the most profitable duration of the working period varies considerably with the nature of the occupation; (8) avoidance of overtime, for if the usual day's work is such as just to stop short of undue fatigue, overtime means overwork.

Further efforts to control the incidence of disease in establishments have been made in those industries where the hazard seemed to be greatest. For instance, in the manufacture of high explosives a valuable code has been formulated (*Public Health Reports*, July 5, 1918). In all rooms where nitration is carried on or where nitro and amido compounds are manufactured or handled, sufficient ventilation for the health of the occupants shall be maintained; no undue accumulation of dust is to be permitted in the workroom; dry sifting or grinding shall take place under cover; sufficient washing and toilet facilities shall be provided for all operatives; medical supervision is compulsory and physical reëxaminations are to be made at frequent intervals; the following persons shall not be employed in this type of manufacture: those under 18 years of age, sufferers from any form of inflammation of the bladder, excessive alcohol addicts, and persons suffering from anemia.

The incidence of furunculosis (boils) among machinists and machine operators has attracted the attention of several investigators. Probably the most important contribution to this subject has been made by the Ohio State Board of Health (*Ohio Public Health Journal*, April, 1918). The conclusions arrived at here are that the incidence of furunculosis and wound infections is abnormally high in certain establishments, that this represents a large economic loss, that the cutting compounds and oils are the vehicles of infection, and that chemical disinfection is of doubtful value. It seems, therefore, that the only means of sterilization at hand is by the use of heat.

In *Public Health Reports* of March 22 and April 5 a description is given of an industrial disease contracted from the use of the air hammer in cutting Indiana limestone. The conclusions arrived at in the report are that among users of the air hammer for cutting stone there appears very commonly a disturbance in the blood circulation of the hands, which consists in spasmodic contraction of the blood vessels of certain fingers, making them blanched, shrunken and numb. These attacks come on under the influence of cold, and are most marked, not while the man is at work with the hammer, but usually early in the morning or after work. The trouble seems to be caused by three factors: long continued muscular contraction of the fingers in holding the tool, the vibrations of the tool, and cold.

The dust hazard in industry is at last receiving an increasing amount of attention. Miller and Smyth (*Jour. Am. Med. Assoc.*, March 2, 1918) have done considerable dust-sampling work in nine industries. They conclude that the industries arranged in the order of their air dustiness are: (1) Portland cement; (2) plush, carpet and blanket making; (3) flint grinding; (4) steel grinding; (5) asbestos; (6) felt hats; (7) pottery; (8) cigar making; (9) silk. It is shown that dust removal at the point of production not only greatly decreases the amount but particularly removes the smaller particles, and also that the substitution of wet for dry processes effectively reduces the air dustiness.

Ventilation.—Additional light has been thrown upon the relative values of the open-air and the mechanical type of ventilation for schoolrooms by the work of Dr. S. J. Baker (*Am. Jour. Public Health*, viii, Jan., 1918). In an investigation carried on in several New York City schools in conjunction with the New York State Commission on ventilation during the periods from February to April, 1916, and from November, 1916, to April, 1917, the relationship of the type of room ventilation to the occurrence of respiratory diseases was studied. It was found that in the closed-window, mechanically ventilated type of classroom, kept at a temperature of about 68° F., the rate of absences from respiratory diseases was 32 per cent. higher than in the open-window, naturally ventilated type of classroom kept at the same temperature, and about 40 per cent. higher than in the open-window, naturally ventilated type of classroom kept at a temperature of about 50° F. Furthermore, that in the closed-window, mechanically ventilated type of classroom kept at a temperature of about 68° F., the rate of respiratory diseases occurring among pupils in attendance was 98 per cent. higher than in the open-window, naturally ventilated room kept at the same temperature, and about 70 per cent. higher than in the open-window, naturally ventilated type of classroom kept at a temperature of about 50° F. In other words, children in rooms with closed windows and ventilated by mechanical methods were more subject to respiratory diseases not sufficiently severe to keep them from school attendance than were children who were in classrooms kept at the same or lower temperature and ventilated wholly by means of open windows. It is to be noted from this study that the effect on respiratory disease is due chiefly to the temperature prevailing in the room rather than to any mystical effect coming from open windows.

Vital Statistics.—Because of unusually late returns to the Bureau of the Census, vital statistics later than those presented in the YEAR BOOK for 1917 (pp. 666-71) are not available. The customary summary is therefore omitted from this issue.

XXVI. ANTHROPOLOGY, ETHNOLOGY, PSYCHOLOGY, AND PHILOSOPHY

ANTHROPOLOGY AND ETHNOLOGY

GEORGE GRANT MACCURDY

General Survey.—Under the increasingly rigorous war conditions it is surprising that several new and important ventures in the field of anthropology should have been attempted or accomplished during the year. In the last issue of the YEAR BOOK (p. 672) the first number of the new *International Journal of American Linguistics* was announced. This year attention must be called to the founding of a new *American Journal of Physical Anthropology* by Dr. Ales Hrdlicka of the U. S. National Museum, who is to be its editor. Three numbers have already appeared. Running in all three is a valuable special communication by the editor, *Physical Anthropology: its Scope and Aims; its History and Present Status in America*, which should be carefully read both by the specialist and by those whose interest in the subject is of a general nature only. In June-July also the first number of *Boletin de la Sociedad Ecuatoriana de Estudios Americanos* appeared (Quito, Imprenta de la Universidad Central).

Another organization reflecting the tendency of the times is the Galton Society founded at the American Museum of Natural History in April. Its objects include the promotion of the study of racial anthropology, migrations, physical and mental characters, and crossing and evolution of human races, living and extinct.

In July the Surgeon-General's Office of the Army established a section of anthropology, in charge of Major C. B. Davenport, to analyze the statistical data obtained from the physical examination of recruits, to secure a better quality of physical measurements, and to assist the War Department in all questions concerning racial characters. In addition to this, numerous anthropometric data have been obtained by anthropologists working in connection with local draft boards and with the Students' Army Training Corps units at the time of enrollment; the securing of like data is being extended also to civilian employees.

At the University of Washington, Dr. T. T. Waterman has been chosen to inaugurate a section of anthropology in connection with the Department of Social Science. F. W. Hodge, head of the Bureau of American Ethnology since 1910, has accepted a position with the Museum of the American Indian, Heye Foundation, New York. The new chief of the Bureau is Dr. J. Walter Fewkes, well known for his original researches in the Southwest. Prof. Roland B. Dixon of Harvard University has been chosen as expert ethnologist to the United States delegation attending the Peace Conference in Paris.

The Angrand Foundation of France has awarded a prize of 5,000 francs to Dr. H. J. Spinden of the American Museum of Natural History, New York, in recognition of his memoir on *Maya Art*, published by the Peabody Museum of Harvard University.

C. H. E. Chubb, who in 1915 purchased the great megalithic monument near Salisbury known as Stonehenge, has presented it to the British Government.

Antiquity of Man.—An important paper on "The Piltdown Jaw," by Gerrit S. Miller, Jr., appears in the first number of the new *American Journal of Physical Anthropology*. Miller points out that the discussion concerning the famous Piltdown remains has passed through two phases and entered a third. In the first phase the lower jaw, though admittedly ape-like in character, was nevertheless regarded as having belonged to the same individual as the skull. Then came a period when in the minds of many the mandible was referred to a genus entirely different from that of the skull, namely to *Pan vetus*, a fossil chimpanzee. In the present or third phase it is asserted by the British group that important and hitherto overlooked features of the lower jaw are positively human, and that the teeth are not only human but fundamentally unlike those of the great apes. Miller endeavors to demonstrate that not one of the eight characters brought forward is human in the diagnostic sense in which the Piltdown brain case and nasal bones are human; on the contrary, they are characters common to both man and the anthropoids. While it may be possible through new material to prove that *Eoanthropus* is a valid genus, neither the original fossils nor the circumstances of their deposition have yet been shown to demonstrate its existence.

It seems that in 1915 additional remains were found about one mile distant from the original site. These are thought by Woodward to belong to the same species as those from Piltdown. But here again, according to Miller, on account of the fragmentary condition of the pieces and certain differences, the demonstration fails to convince.

Personal Identification.—A new volume under this title has been published by Harris H. Wilder and Bert Wentworth (Boston, Gorham Press, 1918). A good deal of misinformation and misunderstanding exists in regard to what has been accomplished in this interesting field of research. The authors have achieved the double purpose of clearing away misconceptions and of blazing the way for a wider application in the future of the principles governing the subject. In fact, they aim at nothing short of a universal system through the establishment of a national identification bureau by each civilized nation. Personal identification means more than keeping tab on criminals; it also means more than finger printing, although this will continue to be a most important factor.

The volume is divided into two parts, the first dealing with methods which furnish partial identification, such as measurements, natural and artificial markings, habits, gait, handwriting, etc., and the second with methods which furnish absolute identification based on a study of the friction skin of the palms, soles and digits. The credit for the practical application of the friction ridges for identification purposes is rightly given to a group of Englishmen, Dr. Henry Faulds, Sir William Herschel, and Sir Francis Galton. It is also pointed out that Alphonse Bertillon, although in 1893 not a believer in the possibility of the practical use of finger prints, by 1895 had added to his descriptive cards a blank for finger prints, thus being one of the first to realize their importance.

While in no way minimizing the importance of digital prints, the authors especially recommend palm and sole prints. In the case of infants, the sole prints are the easiest of all to take, as well as the most satisfactory. The sole print of the infant would thus logically become the basis of any universal system of identification. The volume ends appropriately with a chapter on the present use of friction-ridge identification and its future possibilities.

Heredity.—In the latter half of 1917 the Eugenics Record Office published the results of a study by Dr. C. B. Davenport of the inheritance of stature, based largely upon first-hand measurements of parents and children. Selected communities were chosen including Lexington, Ky., famed for its tall people, sections of Greater New York in which the population is largely from southern Italy, where the stature is among the shortest found in the races of Europe, and communities of English, Welsh, and mixed stock. To these data were added many from volunteer contributors. The conclusion from this study is that there are many separately inheritable factors involved in stature. However, short parents tend to carry some germ cells that lack the shortening factors, and consequently some of the children of such parents are tall. In tall parents the gametes are more nearly homogeneous and all lack most of the shortening factors; consequently the children of two tall parents are usually all tall. It is demonstrated also that the segments of stature, such as length of head and neck, length of torso, length of thigh, and length of lower leg, are inherited separately, and marked deviations from the type in any of these segments may characterize all of the members of one family. Incidentally it comes out that the reason why the people about Lexington, Ky., are so tall is not because of the limestone of the locality, but because they are Scotch. This conclusion was strengthened by observations made in Scotland County, N. C., where there is no limestone and where the people are even taller than at Lexington.

A second publication of the Eugenics Record Office is one on the inheritance of neurofibromatosis, the tendency to produce tumors on the connective tissue of nerve trunks. That the disease is inheritable is indicated by the circumstance that, although very rare, it frequently occurs repeatedly in one family. An analysis of the distribution of the tendency in about fifty families indicates that it is inherited as a dominant trait, which, however, fails to express itself fully in perhaps ten per cent. of the cases.

Another study prepared for publication is that upon the hereditary elements in successful naval officers. A study is made of the families of 89 such officers. It appears that love of sea, or thalassophilia, is very widespread, and appears to be inherited as a dominant trait. Certain nomadic elements come prevailingly from the maternal side. The study makes it quite clear that the successful naval officer is no accident, but the consequence of his combination of inheritable traits, combined sometimes with the favorable environment that his family traits afford.

In connection with this general subject may be mentioned studies by Dr. Hrdlicka on old American families. The total number of subjects examined, mainly for pigmentation of hair, eye and skin color, amounted to over one thousand, all of whom were Americans of at least three generations on both the paternal and maternal sides of the family. The results, which are now being elaborated for a report, are of special interest. They reveal a number of important facts of which we had no previous definite knowledge. For example, as one proceeds northward from the Carolinas and Virginias, there is no increase in blondness, and in passing from New England southward there is no increase in the proportion or grade of pigmentation. Another striking result is that there are localized peculiarities in pigmentation, especially that of the hair, but in every case these can be traced to the ancestry rather than to environmental conditions, this agreeing with Davenport's explanation for tall stature in Kentucky noted above. There does seem, however, to be a slight general reduction in the total proportions of blondness, which Hrdlicka thinks may be due to environment.

An Old Manuscript on the Choctaw.—In the Edward E. Ayer Collection, Chicago, Dr. John R. Swanton of the Bureau of American Ethnology recently brought to light a valuable old narrative in French pertaining to the Choctaw Indians (*Mem. Am. Anthrop. Assoc.*, April-June, 1918). The manuscript, written in a fine clear hand, is entitled *"Relation de La Louisianne."* There is no clue to its author except that on the back are the words "Relat de Kened"; the first and last words appear to be cut off. The manuscript contains 267 pages and has great historical as well as ethnological value.

Linguistics.—Dr. Edward Sapir, in charge of anthropological work for the Canadian Government, has continued his research on a group of languages provisionally known as Penutian, extending from California through Oregon and Washington to the Tsimshian of British Columbia, and is arriving at results of far-reaching importance. One is the apparent linguistic relationship of Tsimshian to a considerable number of languages far to the south, stretching from the Columbia River valley to the southern interior of California. Dr. Sapir has also published a paper on "The Position of the Yana in the Hokan Stock" (*Univ. of Cal. Publs.*, 1917). In the same series for 1918 appears a comprehensive paper on

"The Language of the Salinan Indians" by J. Alden Mason. An extensive Paiute grammar has been completed for incorporation in the *Handbook of American Indian Languages* issued by the Bureau of American Ethnology.

Folklore.—C. M. Barbeau has made progress in his researches in French-Canadian folklore. During the year he has added very materially to his stock of tales, songs and data on old French-Canadian customs. Through his efforts much valuable material has been received also from various coadjutors, notably E. Z. Massicotte of Montreal. The formation of Quebec and Ontario branches of the American Folklore Society evidences the widespread interest in folkloristic labors. A second set of French-Canadian folk-tales, comprising one of the quarterly issues of the *Journal of American Folk-Lore,* has appeared during the year, and an extensive volume on the music of the French-Canadians has been prepared, with the collaboration of Prof. Jean Beck of Bryn Mawr, Pa., for publication in the Memoir Series of the American Folk-Lore Society. In connection with the establishment of the Ontario branch, Mr. Barbeau has arranged for the appearance of a number of the *Journal of American Folk-Lore* devoted entirely to European folklore as preserved in Canada outside of Quebec. Contributors to this number are F. W. Waugh, W. J. Wintemberg, C. M. Barbeau, J. A. Teit, and Miss F. E. Bleakney. During the summer of 1918 Mr. Barbeau undertook extensive researches in the folklore and old-time customs of the French-Canadians of the lower St. Lawrence, accumulating valuable data at Notre Dame du Portage and Ste. Anne des Monts.

The Vanishing Indian.—While the total number of "Indians" as recorded by the census increases from decade to decade, this increase is due wholly to that of mixed-bloods. The full-bloods are vanishing. This fact is emphasized by Dr. Hrdlicka's recent visit to two tribes in Oklahoma. Among the Shawnee he found but three individuals who were full-blood. All three are now old, so that Shawnee full-bloods will disappear with the present generation. Of the 211 Kickapoo settled about McLoud, Okla., not a single pure-blood is left.

Physical Anthropology.—The vast collection of human skeletal material belonging to the Field Museum of Natural History, Chicago, has been arranged geographically, numbered and catalogued, so that data relating to any part of it is readily available. The total number of crania and skeletons is approximately 3,600, while casts number about 200. From South America there are 450 specimens, chiefly from Peru, Bolivia and Argentina. Among these are many interesting examples of deformation and trepanning. A large collection of busts has been obtained from Mexico, and also a very interesting series of crania excavated by Professor Starr near an old temple site at Tezontepec. All these skulls are broken in the occipital region, and it is supposed that they were once displayed on the *tzompantl.* Artificial deformation is found in nearly all these specimens.

Pre-historic American burials are well represented by collections from the neighborhood of Trenton, N. J., from the Hopewell, Oregonia, and Warren County mounds of Ohio, as well as from various sites in Illinois, Wisconsin and Indiana. Cliff-Dweller crania and skeletons number 200, and prehistoric Hopi exceeds 300. Representative collections have been obtained from the Huron, Blackfoot, Iroquois, Pawnee and Sioux, while smaller numbers have come from central and southern groups. The most complete collections from North America come from the Northwest Coast, the Haida numbering 120, Kwakiutl, 100, Nootka, 45, and Chinook, 60. Other groups also are represented. The California material, while small in number, contains many interesting specimens, two of which, gathered by Dr. Hudson, are of an exceedingly primitive type.

The bulk of the negro and white material consists of full skeletons, secured in the Middle West and macerated at the Museum. Some 175 individuals are represented.

Oceanica (South Seas) is particularly well represented by 640 skulls, many of which exhibit interesting examples of carving and face moulding, and small types of skull deformation, trepanning, etc., are found. The collection contains also mortuary figures provided with human heads and other parts of the skeleton. Malaysia and China yield 125 specimens gathered in connection with the Museum's ethnological expeditions. Owing to the scarcity of skeletal material from these regions, the specimens are of special interest.

Many smaller collections covering Egypt, ancient Sardinia, and parts of Africa and Europe are also included in the lists. Since the organization of the section of physical anthropology, considerable attention has been paid to measurements on the living, and charts representing more than 4,000 individuals are now on file. Of these the greater part refer to the Pagan tribes of the Philippines.

At the University Museum, Philadelphia, collections have been amassed that will furnish valuable data on physical anthropology. Much of this material comes from the tombs of the early dynasties at Dendereh in Egypt. Equally important is the large number of well preserved bodies of the Eskimo, which the Museum's expedition to northern Alaska exhumed from the frozen tundra in ancient village sites.

In Canada, Dr. F. H. S. Knowles has made a special study of the physical characteristics of the Iroquois, both living and as preserved to us in skeletal remains. He has also in progress a series of portrait busts to acquaint the public with the main types of Canadian aborigines.

Wisconsin.—Dr. S. A. Barrett of the Milwaukee Public Museum announces the completion of a survey of the prehistoric sites about Buffalo Lake, Marquette County, Wisconsin. The problem was to locate the mounds, village and camp sites, fields, springs, and other archeological features and conditions. Along the borders of this lake, covering a distance of some 25 miles, approximately 850 mounds were located. These were in groups associated with village and camp sites and fields.

Ohio.—William C. Mills reports a satisfactory year of field work, spent for the most part in examining the large aboriginal flint quarries at Flint Ridge, Ohio, especially the central part of the ridge which is in Licking County. Fifteen pits were cleared of débris in order to ascertain the manner in which primitive man secured his supply of flint. Specimens of flint and the principal tools used in quarrying it were found. In all five tons of specimens were gathered from the pits.

The Southwest.—Various institutions have continued their research in the Southwest. Dr. J. Walter Fewkes of the Bureau of American Ethnology has reported on the ruins in southwestern Colorado and southeastern Utah (*Smithson. Misc. Colls.*, lxviii, No. 12, 1918), dealing with the architectural features of towers, great houses and pueblos of that region. His object is to trace their resemblances to Sun Temple and other ruins in the Mesa Verde National Park. Incidentally he suggests that a limited area between 40 and 50 miles from Dolores be set aside by the Government under the name of Hovenweep National Monument. Dr. Walter Hough of the Bureau completed his work on the pit village at Luna, N. M. He also made a reconnaissance of ruins west of Fort Apache and in the western part of the Tonto basin. Neil M. Judd conducted archeological explorations in Utah and Arizona until called to the Aviation Service. Dr. Clark Wissler of the American Museum of Natural History reports that one-half of the famous Aztec Ruin in New Mexico has been uncovered. The ruin will be restored as far as possible and the specimens preserved, at least, for the most part in New York. Leslie Spier of the Museum made a trip to western Arizona to determine the limits of Pueblo culture in that direction.

Central and South America.—The University Museum, Philadelphia, has had an expedition in Guatemala under Robert Burkitt to complete the studies in ethnology and linguistics of the tribes of the Alta Verapaz. The Museum's expedition to the Sierra de Perija in Venezuela under Theodoor de Booy returned in August bringing collections from the Macoa Indians. De Booy was the first anthropologist to visit these Indians. Philip Ainsworth Means, for the U. S.

National Museum, explored prehistoric sites in Peru and Bolivia.

Ethnological and linguistic data have been gathered in Guatemala by the Museum of the American Indian, New York. Important collections were obtained from the southern coast regions, where the little known Szincas still maintain small settlements. An extensive manuscript grammar and vocabulary of the Szinca language was procured for C. P. Bowditch of Boston, who is having it reproduced by the photostat process.

Philippine Islands.—Since 1885 anthropological data on the inhabitants of the Philippine Islands have been accumulating. A review of the data has just been completed by Louis R. Sullivan in a paper entitled, "Racial Types in the Philippine Islands" (*Anthrop. Papers, Am. Mus. Nat. Hist.*, N. Y., 1918). Numerous scattered observations are brought together in an attempt to indicate racial affinities. While the author offers an interpretation, his chief aim has been to present the material in a form that will enable the reader to draw his own conclusions.

The Philippine problem is a part of the larger Malay problem. The existence in the Islands of a Negrito group and a Malay group is recognized by all. Is there any justification for assuming that there is at least one other racial group? The author's comparisons are limited principally to stature, head form, form of the nose, and arm reach. For the sake of convenience the population is divided into Christian, Pagan, Mohammedan, and Negrito; it is of course recognized that the Negrito are also Pagan, but it seemed best to give them a distinct grouping. While the average stature of mankind is 165 cm., that of the Philippine Islanders is 158.5 cm. The head form of the Islanders is brachycephalic, expressed by an average index of 82.2. The average nasal index is 85 (Christian, 81; Mohammedan, 86; Pagan, 90; Negrito, 98). The arm reach of the Negrito is relatively great; in every case it exceeds the stature.

In summarizing the author concludes that there is a third racial type—the Indonesian. The bulk of the population of the Islands, then, is included in three racial types: (1) Malay, with distinctly Mongoloid affinities, comprising about nine-tenths of the total; (2) Indonesian, next in point of numbers, with Mongoloid affinities but in lesser degree than the Malay type; and (3) Negrito with Negroid affinities. Out of a total population in 1915 of 9,503,271, only 35,926 were Negrito. The presence of a pre-Dravidian type in the Islands as a distinct group is not revealed by the data at the command of the author.

The Philippine Collections in the American Museum of Natural History, New York, have been reinstalled by Prof. A. L. Kroeber of the University of California. Another result of Dr. Kroeber's work is a handbook upon the Philippines, which is ready for publication.

Racial Types in the United States.—In the October number of the *American Museum Journal* Louis R. Sullivan has an instructive article on this subject. His conclusion is that although the "melting pot" makes Americans of us all and produces rapid changes in customs and language, it is slow in breaking down the barriers between the diverse biological races. In Hrdlicka's study of old American families a similar conclusion is reached. Sullivan's paper is accompanied by 24 maps, the study of which is recommended.

PSYCHOLOGY

HERBERT SIDNEY LANGFELD

General.—The effect of the war is clearly seen in the activities and writings of the psychologists. R. M. Yerkes, in his presidential address before the American Psychological Association, described the nature of the war work which had thus far been done by psychologists and sketched the plans for the future ("Psychology in Relation to the War," *Psych. Rev.*, March, 1918). A large number of psychologists have been commissioned in the Sanitary Corps to carry out the mental tests which have been introduced throughout the Army. A number of psychologists also have entered the Aviation Corps and are engaged in research and tests in connection with that service. The Committee on Classification of Personnel in the Army, which is doing extensive work on problems of classification, selection, trade tests, etc., is composed to a great extent of psychologists. E. K. Strong has published an account of the work of this Committee (*Am. Jour. Psych.*, June, 1918). The adjutant-General issues a weekly bulletin entitled *Personnel.* Several psychologists are giving their time and attention to the work of reconstruction of the disabled soldier.

Theoretical.—A committee of the American Psychological Association has published a useful report defining and delimiting the most important psychological terms (*Psych. Bull.*, March, 1918). W. E. Hocking, in his book on *Human Nature and its Remaking* (Yale University Press, 1918), has presented many facts of a broad psychological interest in new settings and with added meaning. R. S. Woodworth, in *Dynamic Psychology* (Columbia University Press, 1918), has described the "drive," or impulse, and mechanism in mental life. In *An Introduction to Psychology* (Holt, 1918), J. R. Angell has presented a very brief outline of the science. There is much of importance concerning instincts. A number of papers have been offered bearing upon the objective treatment of psychological facts. J. Peterson believes that in order to correct some of the prevalent errors in social psychology, the nature of ideas must be defined in the objective terms of response ("Functioning of Ideas in Social Groups," *Psych. Rev.*, May, 1918). R. B. Perry, consistent with his desire for a realistic ethics, has defined purpose in the psychological terms of behavior and attitude ("Docility and Purposiveness," *ibid.*, Jan., 1918). K. Dunlap, with the "emotional digits of a psychologist," has given a lengthy description of what he considers the essential characteristics of human beauty ("The Significance of Beauty," *ibid.*, May, 1918). R. M. Ogden has analyzed sound into the attributes of pitch, volume, intensity, duration, and probably brightness ("The Attributes of Sound," *ibid.*, May, 1918). I. G. Campbell has shown the importance in religious psychology of the concept of manaism, or a "reading into" things of the individual self, as contrasted with animism, or a "reading into" things of the social self ("Manaism: A Study in the Psychology of Religion," *Am. Jour. Psych.*, Jan., 1918).

Experimental.—The *Journal of Experimental Psychology* has been discontinued for the present. The other journals, however, have contained much of an experimental nature, and the relative interest in the fundamental problems has remained unchanged. We still find a number of papers upon sensation and perception. The laboratory of the University of Iowa has been particularly interested in the psychology of sound, and articles upon consonance and dissonance, upon binaural beats, and upon musical training have appeared in "The University of Iowa Studies in Psychology," edited by the director, C. E. Seashore (*Psych. Monogr.*, xxv, No. 2, 1918). A. P. Weiss has examined the individual variations in the acuity for intensity and pitch discrimination. The individual differences in the latter are greater than the former ("The Tone Intensity Reaction," *Psych. Rev.*, Jan., 1918). L. T. Troland, in an intensive experiment at the Nela Laboratory of the General Electric Co., has found that small differences of color exert a relatively large influence upon the discrimination of differences in brightness ("Differential Threshold for Brightness," *ibid.*, July, 1918). P. Reeves has made some interesting measurements by means of photographs of the rate of response of the pupil to light stimulations ("Pupillary Dilation and Contraction," *ibid.*, July, 1918). G. W. Stewart and O. Honda discovered that the amount of displacement of sound caused by intensity difference only is proportional not to the logarithm of the stimulus but to the logarithm of the ratio of two stimuli ("The Intensity Factor in Binaural Localization; An Extension of Weber's Law," *ibid.*, May, 1918). J. J. B. Morgan has examined the various factors involved in estimating the amount of force exerted under different conditions and the best way to learn accurately to judge muscular exertion ("The Perception of Force," *ibid.*, Jan., 1918). C. L. Friedline has found extreme delicacy in perceiving two points in the skin ("The Discrimination of Cutaneous Patterns Below the Two Point Lines," *Am. Jour. Psych.*, Oct., 1918). As usual, a number of articles upon memory have appeared. In a work upon "Associative Aids," H. B. Reed has confirmed former findings that logical associations are a greater aid to memory than outer associations such as contiguity, rhyme, etc. (*ibid.*, March and July, 1918). S. Froeberg found that, contrary to the assertions of Wohlgemuth, two ideas do not have to be in the mind at the same time in order to have an association formed between them ("Simultaneous Versus Successive Associations," *ibid.*, March, 1918). E. C. Tolman and I. Johnson have found that not only unpleasant words but any words of deep emotional effect lengthen the time of their association in the memory process ("A Note on Association Time and Feeling," *Am. Jour. Psych.*, April, 1918). H. D. Williams believes that exact psycho-physical methods can be used to determine a threshold for memory ("On the Calculation of an Association Limen," *ibid.*, April, 1918). The other chapters of psychology have not received so much attention. E. E. Cassel and K. M. Dallenbach have shown "The Effect of Auditory Distraction Upon the Sensory Reaction" (*ibid.*, April, 1918). The question as to whether pleasantness and unpleasantness can be felt at the same time, has been answered in the negative by P. T. Young ("An Experimental Study of Mixed Feelings," *ibid.*, July, 1918). G. C. Myers has found that practice does not appreciably change the ranking of individuals according to efficiency ("Some Variabilities and Correlations in Learning," *ibid.*, July, 1918). The full title of A. A. Roback's monograph, "The Interference of Will-Impulses with Applications to Pedagogy, Ethics, and Practical Efficiency," explains the nature and scope of his extensive experimental research (*Psych. Monogr.*, xxv. No. 5, 1918). R. Pintner had a number of individuals judge intelligence from the photographs of children who had already been subjected to mental tests. Many very poor judgments were made ("Intelligence as Estimated from Photographs," *Psych. Rev.*, July, 1918). H. S. Langfeld has studied the effect of suggestion on the judgments of facial expressions ("Judgments of Facial Expression and Suggestion," *ibid.*, Nov., 1918). M. Otis arranged an experiment to investigate the separate influences of position, size, form, color, and direction upon the unity of a design ("Aesthetic Unity," *Am. Jour. Psych.*, July, 1918). M. Luckiesh has investigated the phenomenon, important for æsthetics, of some colors' appearing nearer than others ("On Retiring and Advancing Colors," *ibid.*, April, 1918). Joseph Peterson has described an objective method in "Experiments in Rational Thinking" (*ibid.*, Oct., 1918).

Abnormal.—An addition to the Freudian literature is a paper of P. Blanchard, who has made a study of the mental life of August Comte by the use of the psycho-analytical method ("A Psycho-Analytical Study of August Comte," *ibid.*, April, 1918). H. L. Hollingworth opposes the Freudian view in his "Redintegrative Mechanisms in the Psychoneuroses" (*Jour. Philos., Psych., and Scientific Methods*, June 20, 1918). Mental tests continue to be extensively used. The *Psychological Clinic* for 1918 has published papers dealing with the use of the Binet tests on retarded pupils, and upon the various form-boards, and the Witmer cylinder test. A. J. Rosanoff, H. E. Martin, and I. R. Rosanoff have issued a monograph entitled "A Higher Scale of Mental Measurements and Its Application to Cases of Insanity," in which they have developed a free association test and submitted test records from 1,000 subjects (*Psych. Monogr.*, xxv. No. 3, 1918). J. V. Haberman has written a good historical survey and criticism of mental tests as used for diagnostic purposes, and has included an account of the tests used in the Vanderbilt Clinic of the College of Physicians and Surgeons ("Probing the Mind. Second Report. The Intelligence and Its Examination," *Medical Record*, May, 1918). J. N. Curtis has made use of "Point Scale Examination of the High-Grade Feeble-

Minded and the Insane" (*Jour. Abnorm. Psych.*, June, 1918). L. H. Horton has described cases of flying in dreams and explains them as due to relaxation of the muscles and vasomotor changes ("The Illusion of Levitation," *ibid.*, April and June, 1918). O. J. Johnson has shown some "Effects of Smoking on Mental and Motor Efficiency" (*Psych. Clinic*, June, 1918). Ping Ling has discussed various aspects of eugenics in "Feeble-Mindedness and Heredity" (*Pedagogical Seminary*, March, 1918). O. Bridgeman is the author of a monograph describing "The Experimental Study of Abnormal Children with Special Reference to the Problems of Dependency and Delinquency" (University of California Press, 1918).

Applied.—Concerning war problems, we find several important papers. A. I. Gates has described "The Ability of an Expert Marksman Tested in a Psychological Laboratory" (*Jour. Applied Psych.*, March, 1918). H. E. Burtt has been working upon tests for aviators and has published an article entitled, "The Perception of Slight Changes of Equilibrium, with Especial Reference to Problems of Aviation" (*ibid.*, June, 1918). H. C. Link has devised a series of tests relative to shell inspection and gauging of shells for minimum and maximum head-thickness ("Experiment in Employment Psychology," *Psych. Rev.*, Jan., 1918). Much of the work in applied psychology concerns the selection of employees and vocational guidance. E. L. Thorndike has contributed to methods a paper entitled, "Fundamental Theorems in Judging Men" (*Jour. Applied Psych.*, March, 1918). R. Pintner and H. A. Toops have described the results of "Mental Tests of Unemployed Men" which they used at two employment offices (Part 2, *ibid.*, March, 1918). J. K. Flanders has described "Mental Tests of a Group of Unemployed Men Showing Correlations with Estimates Furnished by Employer" (*ibid.*, Sept., 1918). E. Oschrin has described "Vocational Tests for Retail Saleswomen" (*ibid.*, June, 1918). History and problems of vocational guidance have been treated by J. M. Brewer in his book, *The Vocational Guidance Movement, Its Problems and Difficulties* (MacMillan, 1918). The Bureau of Salesmanship Research of the Carnegie Institute of Technology is now supplemented by the Research Bureau for Specialized Training for the Retail Business. There is a growing demand for psychological examiners, and an American Association for Clinical Psychologists has been formed. Several articles have appeared in the *Journal of Applied Psychology* for 1918 concerning the training of such psychologists. S. E. Pond performed a series of experiments to discover means to master the technique of musical instruments ("A Contribution to the Study of Instrumental Music," *Jour. Applied Psych.*, March, 1918). M. Luckiesh has arranged the psychological facts of color for the use of artists (*The Language of Color*, Dodd, Mead, 1918).

Educational.—In the educational field, as elsewhere, mental tests are assuming an ever increasing rôle, as will be seen from the titles of articles in the *Journal of Educational Psychology*: mention should be made of a paper by F. N. Maxfield on "Some Mathematical Aspects of Binet-Simon tests" (Jan., 1918); one by C. T. Gray, "A Comparison of Two Types of Learning by Means of a Substitution Test" (March, 1918); and one by G. S. Otis on "An Absolute Point Scale for the Group Measurement of Intelligence" (May and June, 1918). M. E. Haggerty has made "Tests of Applicants for Admission to University of Minnesota Medical School" (*ibid.*, May, 1918). S. L. and L. W. Pressey describe "A Group Point Scale for Measuring General Intelligence, with First Results from 1,100 School Children" (*Jour. Applied Psych.*, Sept., 1918). R. Pintner, by a series of tests, has found that siblings resemble one another in general intelligence more than unrelated children ("The Mental Indices of Siblings," *Psych. Rev.*, May, 1918). The learning process has not been neglected. W. F. Dearborn and J. M. Brewer have examined individual differences and characteristics of the learning curve, relearning, etc. ("Methods and Results of a Class Experiment in Learning," *Jour. Ed. Psych.*, Feb., 1918). S. M. Fukuya's experiment to ascertain the effect of extra attentive effort of the student will interest the educator ("An Experimental Study of Attention from the Standpoint of Mental Efficiency," *Psych. Monogr.*, xxv. No. 4, 1918). F. Mateer in *Child Behavior* (Badger, 1918) has made an interesting study of children by means of the conditioned reflex.

PHILOSOPHY

HARRY TODD COSTELLO

Philosophy and the War.—The year has been unusually prolific in new books on philosophy, many of them of permanent value. This output represents of course, most of it, writing done prior to the entrance of the United States into the war, and certainly the academic teaching of philosophy has suffered from what have seemed at the moment more pressing needs of an immediately practical sort. In many universities and colleges, the departmental staffs have become reduced to a minimum, and even those remaining are often primarily engaged in works of national service not directly concerned with philosophy. It has been maintained that the fact that no philosopher, as such, has been called into consultation by the Government is a proof of the low esteem in which philosophy is held. But philosophers would hardly expect or desire to wield that sort of direct power, and the indirect influence of anyone maintaining a truly philosophic attitude is probably greater to-day than ever before. It remains the case, however, that some of the best work of the year by such leaders in American philosophy as A. O. Lovejoy and John Dewey has been their writings on subjects apparently quite remote from technical philosophy.

In England the war has not dampened the ardor for philosophy even of a highly technical sort, and the sessions of the Aristotelian Society have been largely attended, two thick volumes of *Proceedings* (1916-17, 1917-18) having appeared during the year. As in past years, English and American philosophy have so largely interacted that it is impracticable to separate the two. Bertrand Russell's unfortunate differences with English governmental policies have had at least one good indirect effect in bringing him back to further strictly philosophical inquiries. Russell and Bergson remain the foreign philosophers most discussed in America.

History of Philosophy.—Norman Kemp Smith, lately professor at Princeton but now in the British service, has again illustrated the fairness of the English even towards their enemies by publishing the most noteworthy book of the year on German philosophy, a detailed, scholarly and sympathetic *Commentary to Kant's "Critique of Pure Reason."* Equally important is a commentary written in Great Britain on John Locke's famous *Essay*, namely, *Locke's Theory of Knowledge and its Historical Relations* by James Gibson. A work valuable for its acquaintance with the literature of its subject is Wm. M. Salter's *Nietzsche the Thinker* (1917). Paul Elmer More's *Platonism*, lectures delivered at Princeton (1917), while hardly doing justice to its subject, is a work of merit. The members of the Department of Philosophy of Columbia University have combined to publish a volume of essays, largely semi-technical investigations in the history of philosophy, entitled, *Studies in the History of Ideas.* It was the intention that this should be the first volume of a series, but the war has prevented continuation and delayed publication of the first volume. Neo-Platonism has recently come in for especial attention from Dean W. R. Inge, A. E. Taylor and others, and a four-volume translation of Plotinus by Kenneth S. Guthrie has appeared.

Among expository works on recent philosophy, we may mention the elementary *Manual of Modern Scholastic Philosophy*, edited by Cardinal Mercier, of which the English translation in two volumes has appeared during the year; Helen Parkhurst's *Recent Logical Realism*, which treats of the German logicians Husserl and Meinong, though hardly sympathetically or adequately; and H. W. Carr's *Philosophy of Benedetto Croce.* Croce's *Logic* has also been translated, but much of Croce's brilliance evaporates in both Carr's exposition and the existing translations, so that here, as elsewhere, Italian philosophy remains largely a closed book for most English readers. The philosophy of the late Josiah Royce of Harvard has received new recognition abroad in a book by F. Olgiati in Italian, and a lengthy article in French by G. Marcel (*Rev. de Métaph.*, May-July, 1918).

Ethics.—Both the American Philosophical Association meeting at Princeton on Dec. 27 and 28, 1917, and the Western Philosophical Association meeting at Northwestern University on March 29 and 30, 1918, were largely taken up with ethical discussions growing out of the war. Many of these papers have subsequently been printed, particularly in the *International Journal of Ethics*. Of books directly the outcome of war-problems may be mentioned H. B. Alexander's *Liberty and Democracy* and *The Present Conflict of Ideals* by Ralph Barton Perry. W. E. Hocking has published a notable book on *Human Nature and its Remaking*. Another stimulating study, falling rather more under social science, is *Theories of Social Progress* by A. J. Todd. Prof. Perry's book, above mentioned, may, because of its encyclopedic character, serve as a guide to the further literature of contemporary social philosophy.

Walter G. Everett, professor in Brown University, has published the most important ethical textbook of the year, bearing the title, *Moral Values*. Its interest is in theoretical ethics, being much less sociological and historical than the well known text by Dewey and Tufts, but its argumentation is relieved by a human touch. J. Laird's *Problem of the Self*, more metaphysical than ethical, is also characterized by clear, connected argument. Felix Adler's *An Ethical Philosophy of Life* stands forth because of its remarkable autobiographical sketch of the leader of the Ethical Culture movement. A minor work is *Some Suggestions in Ethics*, by Bernard Bosanquet.

Logic.—Interest in logic was much in evidence at the 1917 meeting of the American Philosophical Association; and the 1918 meeting, with its carefully prepared joint debate between scientists and philosophers on the subject of vitalism, the papers being published in advance in the *Philosophical Review* for November, 1918, shows the present desire to bring philosophy and science more closely in touch. The most notable books of the year on logic and allied subjects are probably the English ones by Bertrand Russell, under the title, *Mysticism and Logic*, reprints of essays, including the now famous "A Free Man's Worship"; and by A. N. Whitehead, entitled, *The Organization of Thought*, a book widely praised. Showing the same direction and influence in America is *The New Rationalism* by E. G. Spaulding.

Among works on science of interest to the logician, we must especially mention the *Short History of Science* (1917) by W. T. Sedgwick and H. W. Tyler, almost the only simple work on the subject in English that is of value, though laying rather too much stress on earlier mathematical science and not enough on the recent developments of biology and the social sciences. More advanced are the *Studies in the History and Method of Science*, edited by C. Singer.

General Philosophy.—The *Elements of Constructive Philosophy*, by J. S. Mackenzie, represents the older Hegelian idealism. An important work announced as in press near the close of the year is *The Strife of Systems*, by W. H. Sheldon of Dartmouth College. *Mens Creatrix* (1917), by William Temple, is a clever popularization of philosophy, though going over into Christian theology. Another attempt at that very difficult thing, an introduction to philosophy for beginners, is *The Field of Philosophy* by J. A. Leighton. *A Defense of Idealism* (1917), by May Sinclair, contains a delightful introduction and a good chapter on "Mysticism"; otherwise it is dilettantish.

Numerous articles in the philosophical periodicals, such as Wm. E. Johnson's "Analysis of Thinking" in *Mind* (Jan. and April, 1918), and various valuable articles by Chas. D. Broad in *Mind* and the *Monist*, are deserving of special mention if space permitted.

XXVII. RELIGION AND RELIGIOUS ORGANIZATIONS

CHRISTIAN CHURCHES

H. K. Carroll

BAPTIST

Northern Baptist Convention.—The Northern Baptist Convention, held at Atlantic City on May, 15-22, considered the various denominational activities, including the five general societies, home missions, foreign missions, education, publication, etc. It was emphatically a war convention, and pledges of support of President Wilson, of acquiescence in the requests of the Food Administration, and of approval of the prohibition of the manufacture and sale of intoxicants were made. Action was taken to harmonize the differences between the Home Mission Society and the Board of Publication concerning the conduct of work among the rural churches. While the prosecution of this enterprise is left in the hands of the Publication Board, a measure of conference and coöperation is ensured.

The Southern Baptist Convention, held at Hot Springs, Ark., in May, under the presidency of Dr. J. B. Gambrell, was attended by 3,500 delegates and accomplished important business. A radical action was the vote to admit women hereafter to membership in the Convention with equal rights with men. A report on evangelism expressed regret that evangelism is apparently declining, and that student pastors are doing most of the baptising. Interest in the welfare of the Negroes was evinced, particularly in the appointment of a committee to confer with Northern Baptists on giving "reconciling and helpful ministry" to Negro Baptists. To this end the Convention voted to raise $50,000 for a Negro Theological Seminary.

LUTHERAN

Lutheran Union.—The greatest event in the history of Lutheranism for fifty years or more is the merging of three of the large general Lutheran bodies, namely, the General Synod, the General Council, and the United Synod South. This movement, begun in 1917 (*A. Y. B.*, 1917, p. 686), has had a history most remarkable for its smoothness and celerity. The constitution of the proposed United Lutheran Church in America was adopted with practical unanimity by identical resolutions by the general bodies in 1918, and was sent down to the district synods of each of the three bodies for approval. There are 44 of the synods, of which 24 are in the General Synod, eight in the United Synod South, and 12 in the General Council. All of the 44 synods save one, the Augustana, ratified the movement for union. The Augustana, a large Swedish body of 191,000 communicants, has not been very closely identified with the General Council for some years, and it decided not to enter the Union. It has launched a movement of its own for the formation of a union of Swedish Lutherans, similar to that established among the Norwegian Lutherans in 1917 (*A. Y. B.*, 1917, p. 686); it also would like to form a Lutheran Federation.

In accordance with the provisions of the resolutions calling for union, a final meeting of each of the three bodies, the General Council, the General Synod and the United Synod South, was held in New York on Nov. 11-13 for the transaction of the necessary final business for the accomplishment of the consolidation. These meetings were then formally dissolved, and on Nov. 14 the delegates of the various conferences met in joint session, in Holy Trinity Lutheran Church, as the General Convention of the United Lutheran Church in America. There was a sermon by Rev. Henry E. Jacobs, dean of the Theological Seminary, Philadelphia, followed by the holy communion. The next day the Convention was fully organized, and the United Lutheran Church in America began its legal and effective existence. Dr. F. H. Knubel, of New York City, was elected president, Dr. M. G. G. Scherer, of Charleston, S. C., secretary, and E. Clarence Miller, of Philadelphia, treasurer. The constitution adopted by the three bodies merged in the new organization sets forth the doctrinal basis as consisting of the canonical scriptures of the Old and New Testaments as the inspired word of God, of the three ecumenical creeds—the Apostles', the Nicene and the Athanasian, and of the Unaltered Augsburg Confession. It also recognizes the Apology, the Smalkald Articles, the Large and Small Catechisms of Luther, and the Formula of Conford for use in interpretation. The merging includes the consolidation of the various boards—foreign missions, home missions (English, Swedish, and immigrant), publication, education, etc., and will result in some economy of expense. The new Church will have about 760,000 communicants, 2,700 ministers, and 3,800 churches. The Church has been incorporated, as also the various boards, which will have headquarters in New York, Philadelphia, Pittsburgh, Baltimore and Chicago. The Lutheran is one of the oldest communions in America, ranking next after the Roman Catholic, the Reformed Dutch, the Congregational, and the Church of England. Its first church in Canada was formed in 1619, and its first in Pennsylvania in 1639.

METHODIST

Methodist Unification. — Negotiations for the unification of the Methodist Episcopal and Southern Methodist Episcopal Churches (*A. Y. B.*, 1917, p. 688) disappointed the expectations of its ardent friends. Two sessions of the Joint Commission were held in 1918, one at Savannah, Ga., in January, and the other at St. Louis, Mo., in April. Most of the features of the general plan had been agreed to tentatively, but the representation of the Negro Methodists in the proposed General Conference was the most difficult question. The Southern commissioners desired a separate organization of the Negroes (about 345,000) in the Methodist Episcopal Church, although they supported a proposition to create a jurisdictional conference of colored Methodists, with the privilege of reduced representation in the supreme body, the General Conference, with other jurisdictional conferences (white). At Savannah, the possibility of agreement on this measure gave ground of hope of a final conclusion for union at the St. Louis meeting; but this hope was not realized, and it developed that the Methodist Episcopal commission was not disposed to support any plan which gave less than full representation to the Negro jurisdictional conference, or to approve of the proposition advanced by the Southern commissioners to the effect that when the Negro jurisdictional conference should reach a membership of 600,000, it should automatically become a separate and independent body. There were also other points of disagreement, the feeling apparently gaining ground that the plan of unification was a cumbrous and unwieldly one and would break down when put into operation. When the report of the Southern commission came before the Southern General Conference, held at Atlanta in May, there were two reports from the committee to which the matter had been referred, a majority and a minority report. The former reaffirmed the action of the preceding General Conference of 1914 and provided for the continuation of negotiations; the latter would have practically closed the door to further consideration of the question. After a long debate, the Conference adopted the majority report by an almost unanimous vote, only seven delegates dissenting, and ordered a new commission. The Conference indicated a strong desire for unification, but the next move in the matter rests with the Northern commission, which may think it well to await instructions from the General Conference, which meets in 1920.

Unification of Negro Methodist Churches.—At the meeting of what is known as the Federative Council of three Negro Methodist Churches, held at Louisville, Ky., in February, a joint commission was named to form a plan of union for these bodies. The Council, which meets once in three years, is composed of bishops of the African Methodist Episcopal, African Methodist Episcopal Zion, and Colored Methodist Episcopal Churches. The joint commission met in April in Birmingham, Ala., and adopted 12 articles of agreement as a basis of union of the three Churches. The General Conference of the Colored Methodist Episcopal Church, which met in Chicago in May, promptly approved of the articles of agreement and sent them down to its annual conferences for ratification. The General Conferences of the other two bodies do not meet until 1920. They are expected to take action then, and if it is a favorable action, the question of ratification will go to their respective annual conferences. Reports will be made of the result in 1924. If all goes well, union of the three bodies will then take place, and the "United Methodist Episcopal Church" will be organized, with upwards of a million and a quarter of members.

General Conference of the Southern Methodist Episcopal Church.—The quadrennial meeting of this body was held at Atlanta in May. Action was taken on the question of union with the Northern body (*supra*) and on other denominational matters. A missionary programme, embracing fields in the Americas, Asia and Africa, was adopted, involving the raising of $7,000,000 a year, including $1,000,000 a year for war work. Three bishops (Hoss, Morrison and Waterhouse) were retired on account of age, and six were added to the remaining number, making an active episcopal force of 16 for the coming quadrennium. The new men are Bishops John M. Moore, W. F. McMurry, W. V. A. Darlington, H. M. DuBose, W. M. Ainsworth, and James Cannon, Jr. After a notable discussion it was voted to admit women to the General Conference and to other lay privileges enjoyed by the men, but the bishops interposed a veto, on the ground that a constitutional question was involved. By a vote of 265 to 57 the Conference adhered to its action and sent it down to the annual conferences for approval. If ratified by a three-fourths vote, the measure becomes at once effective. Another question that received large consideration was that of extending the limit of the pastoral term beyond four years when the quarterly conference of any church so requests and a majority of the presiding elders of an annual conference concur by ballot. This innovation was adopted.

Methodist Missions.—The missionary interests of the Methodist Episcopal Church were thoroughly cared for during 1918, and a heavy increase of income was reported. It was sufficient in the case of the Board of Foreign Missions to keep up all its work and liquidate its debt, so that it starts the year 1919 with a clean slate, and makes considerable advances in its appropriations for next calendar year. The receipts of the Board for 1918 exceeded $2,350,000, passing the two-million mark for the first time in its history. The Board of Home Missions and Church Extension received about $2,000,000, the highest figure in its history. These receipts for both Boards include the war work contributions, amounting to between $400,000 and $500,000. The Women's Foreign Missionary Society gathered for the year $1,346,000, and the Women's Home Society, $1,156,000, making a grand total for missionary work of nearly $7,000,000 for the Church. In 1919 the Church begins its five-year centenary missionary programme for the raising of $16,000,000 a year, or an advance of $9,000,000 over the income of the year 1918. All other benevolent interests of the Church shared in the missionary prosperity.

Canadian Methodism.—The quadrennial General Conference of the Methodist Church of Canada was held in Hamilton, Ont., in October. Resolutions favorable to union and cooperation with other Christian bodies were adopted. The projected union with the Presbyterian and Congregational Churches, which by action of the former is not to be taken up until the second year after the war, was in the mind of the Conference, which expressed regret that the union had not taken place before the war, as it would have been of great service in coördinating war activities and saving useless expenditure of means and effort. Meanwhile, by mutual agreement, the subject is not to be discussed. The General Conference adopted unanimously a measure granting to women all laity rights enjoyed by men, including representation in the annual conferences and in the General Conference. It does not, however, open the door to the entry of women into the ministry. The extension of the limit of the pastoral term, which the basis of union with the Presbyterian and Congregational Churches will fully remove, was discussed, but the action taken only allows extension of the term in special cases in which concurrence of the annual conference with a two-thirds vote of the stationing committee is required.

PRESBYTERIAN

Northern Presbyterian General Assembly.—This body, meeting at Columbus, Ohio, in May, considered the matter of union with the Southern Presbyterian Church, on the basis of the report of the committee appointed in 1917 to meet a similar committee of the Southern Assembly (*A. Y. B.*, 1917, p. 691). The committee of the latter at the joint meeting had presented letters from 300 leaders in that body opposing union and intimating that if union were pressed, it might cause a division. There was no progress to report, therefore, toward the goal upon which the Northern Assembly had fixed its gaze for several years. The Southern body was ready, it appeared, neither for a federal union of all Presbyterian and Reformed Churches, nor for organic union with any.

The Northern Assembly, finding the door shut to reunion, at least for the present, conceived and launched a much greater plan of organic union, namely, the merging of all evangelical Churches. It declared that the time is ripe for such a general movement. The situation created by the war, in its opinion, had broken down sectarian walls in camp and on the battlefield, and great international movements, political, social and industrial, call for a union of the religious forces. The General Assembly therefore instructed its Committee on Coöperation and Union to fix the time and place for a meeting of an interdenominational council of evangelical Churches, invite the denominations to appoint representatives, fix a ratio of representation, prepare a tentative plan of union for consideration, and make all necessary arrangements for the meeting of the Council. The moderator, Dr. J. Frank Smith, was added to the Committee, of which Dr. William H. Roberts, of Philadelphia, is chairman. At a preliminary conference, held in Philadelphia, Dec. 4-6, attended by representatives of 15 denominations — Baptist, Friends, Lutheran, Methodist, Presbyterian, Reformed, Protestant Episcopal, United Brethren — a declaration was made for organic union, absolute or federal, and a committee appointed to promote it, arrange for a Council not later than 1920, and prepare for its consideration a plan or plans of union. The Assembly sent a message of greeting to the Patriarch of the Russian Church at Moscow, expressing the hope that the aspirations of the Church for unity and liberty would be realized.

Southern General Assembly. — Dr. James I. Vance, Louisville, Ky., was elected moderator of this body, which met at Durant, Okla., in May. It was opened with prayer by Rev. A. J. McQueen, a colored commissioner. The report of the Assembly's committee of conference with the Northern Assembly's committee was to the effect that organic union with that body could not be carried into effect, but recommended federal union with all Presbyterian bodies. This report was referred to a committee of 17, one from each of the synods, and the committee made two reports, a majority, signed by 16, and a minority, signed by one. The former recommended approval of organic union, or as an alternative, federal union, as proposed by the Northern Assembly. After a full discussion the minority report was adopted, which supported the views of the conference committee that neither organic nor federal union is practicable, the vote being 161 to 71. The conference committee was continued for another year.

United General Assembly.—This body met in Pittsburgh in May. Rev. W. M. Anderson was moderator. The Assembly in its proceedings indicated hearty sympathy with the idea of organic union.

Cumberland General Assembly.—The annual meeting of this body was held in Dallas, Texas, in May. The U. S. Supreme Court gave decision in the long litigation over church property involved in the adoption a dozen years ago of the project of organic union with the Northern Church. The decision was in favor of the claims of the united body to the denominational property.

Presbyterian General Assembly in China.—All Presbyterian bodies, American, Canadian, Australian and British, having missions in China have united in forming a native Presbyterian Church with a General Assembly of its own. This follows the precedents established in India and other mission fields of having but one denomination and one denominational organization under the Presbyterian name instead of many.

The New Era Movement.—The Presbyterian Church (Northern) has inaugurated a "New Era Movement," with headquarters in New York City. Its purpose is to bring all the Church agencies—home and foreign missions, education, publication, etc., under one coöperative leadership, so that "the whole Church may be engaged in the whole work of the Church" instead of in spasmodic effort for first one cause and then another. "The Church proposes to follow up the spirit of the day and adapt its business methods to those which are so successful in the great philanthropic movements of the day, such as the war-work programme of the Y. M. C. A. and the Red Cross." A financial plan embracing all the agencies will be adopted and prosecuted.

PROTESTANT EPISCOPAL

World Conference of Faith and Order.—This movement, launched some years ago (*A. Y. B.*, 1910, p. 732), for the reunion of Christendom has received much attention recently from a committee representing the Church of England and the Free Churches of England. A second interim report deals with the question of the historic episcopate, coming to the conclusion that it should be preserved and continued; that it should reassume a constitutional form and be selected as in the beginning by the ministry and the laity; and that acceptance of the fact of the episcopacy only should be required, not of any particular theory of it, such acceptance not to be understood as involving the disowning by any Church of its past. Each body entering into the union should be expected to bring its own particular contribution to the united Church. The report adds: "Within such a recovered unity we should agree in claiming that the legitimate freedom of the prophetic ministry should be carefully preserved; and in anticipating that many customs and institutions which have been developed in separate communities may be preserved within the larger unity of which they have come to form a part."

The Commission of the Faith and Order Movement, encouraged by the response to the invitation (*A. Y. B.*, 1917, p. 692) to observe the octave, Jan. 18-25, 1918, as a period of prayer for the advancement of unity, renews the appeal for the corresponding period in the year 1919. Bishop C. P. Anderson, president of the Commission, sent greetings to the Patriarch of the Russian Church on the occasion of the holding of its first free and democratic Council in Moscow, and received from the Patriarch grateful recognition of the fraternal expression. The exigencies and emergencies of the war have prevented any considerable degree of progress in arrangements for the first world conference. So far 61 commissions have been appointed to promote the world conference, representing all the leading communions of the world except the Roman Catholic and the Eastern

Orthodox, which have not yet received formal official invitations, but which through many of their most distinguished officials have shown a sympathetic attitude.

Unity Measures. — The House of Bishops of the Protestant Episcopal Church has made reply to a memorial of Drs. Newman Smyth and Williston Walker of the Congregational denomination and others of various Churches, suggesting joint ordination, as a war measure, of chaplains for the Army and Navy. The reply says that no remedy for the existing evils of division is to be found in such a measure. The differences lie deeper than ordination, in many cases touching fundamental beliefs. Some of the Churches represented by the memorialists have no central authority with which to deal, each congregation being independent and self-governing. The adoption of "ill-considered expedients would," the bishops say, "endanger and retard Christian unity." Another proposition for intercommunion membership and ordination of different churches, originating in New Brunswick, also received the attention of the House of Bishops, whose action was adverse, on the ground that confirmation cannot be surrendered or ordination granted to men not responsible to those bestowing ordination.

A National Student Council has been developed to keep the influence of the Church more distinctly about students in colleges and to enlist students in Sunday-school teacher training and for similar purposes. The membership of the Council includes representatives from various official boards of the Church and is intended to coördinate these boards in this kind of work. The General Board of Education has been very active in promoting better educational standards in Sunday schools, especially through the "Christian Nurture Series" which it has issued for the purpose. Its activities have also extended to the subject of preparing for a better equipped ministry and for ministering to students. The Brotherhood of St. Andrew has materially expanded its work among young men through an advance programme published near the end of the year. The missionary activity of the Church has been somewhat embarrassed by the fear of a considerable deficit at the end of the year, though its work was not contracted by reason of war emergencies.

A Negro Suffragan Bishop.—The Protestant Episcopal Church has so far failed, in its General Convention, to provide any plan for Negro dioceses, missionary districts or bishops. The diocesan convention of North Carolina, however, has elected a Negro priest, Rev. Henry Beard Delany, archdeacon of colored work hitherto, to be suffragan bishop for work among the colored people in the dioceses of North and South Carolina. Suffragan bishops have no seat or vote in the House of Bishops but are eligible to election as coadjutor or diocesan bishops. Bishop Delany is the first Negro bishop of his denomination in the United States. There have been Negro bishops in Africa and in the West Indies.

ROMAN CATHOLIC

Deaths of Distinguished Prelates.—Cardinal Farley, Archbishop of New York, and Archbishop Ireland, of St. Paul, Minn., died in the latter part of the year. The former was at the head of the largest province and archdiocese in the Church, and the latter was noted for his ability as an administrator and for his advocacy of what has been known as the Americanization of Catholicism.

Growth of the Church.—Notwithstanding the cessation of immigration in the years of the war, the Roman Catholic Church continues to report a large increase in its population. At the end of 1917 there was a Catholic population (including communicants and baptized children) of 17,416,303 in the United States, not including the insular possessions. Of the dioceses, 59 indicated increases and four decreases, 38 reporting no changes. The net increase for the year was 393,424. The number of priests was 20,477, of whom 5,555 are members of the religious orders. There are 13 provinces, two of which are vacant; churches and missions number 15,817. In the parochial schools there are 1,593,407 children. The leading Catholic states, according to number of Catholics, are: New York, 3;088,406; Pennsylvania, 1,885,000; Illinois, 1,482,574; Massachusetts, 1,406,000; Ohio, 858,609; New Jersey, 728,073; Michigan, 631,500; Louisiana, 599,900; Wisconsin, 592,233; California, 577,993; Missouri, 534,570; Connecticut, 516,579. It is usually estimated that 85 per cent. of the Catholic population represents communicants.

The meeting of the Federation of Catholic Societies, the chief convention event of the Catholic world, was omitted in 1918 on account of the War. These conventions attract thousands of Catholics, prelates, priests and laymen from all parts of the country.

MISCELLANEOUS

English Free Church Federation.—The Free Evangelical Churches of England, including Baptists, Congregationalists, Methodists, Presbyterians and other Noncomformist bodies, have formed a Free Church Federation and adopted a declaratory statement of faith and practice, with the Rev. Dr. Guttery, president of the Primitive Methodist Conference, as its chairman. It is a body similar to the Federal Council of the Churches of Christ in America. The declaratory statement acknowledges the headship and sovereign authority of Jesus Christ, affirms that the Catholic or Universal Church consists "of the whole company of the redeemed in heaven and on earth," and recognizes "as belonging to this holy fellowship all who are united to God through faith in Christ." The united strength of the Churches composing this Federation includes upward of 2,000,000 members, with more than 9,000 ministers.

Relations between the Church of Scotland and the Church of England.— Can these two Established Churches, Presbyterian and Episcopal respectively, be brought into nearer relations? Moderator Cooper of the Established Church of Scotland discussed this question in the crypt of St. Paul's, London, under the presidency of the Bishop of London. He said that a closer relation though not yet a fact, was nevertheless beyond the visionary stage in Scotland and was coming more into the thought of the people. The union of these two communions should lead to a larger union and a united Church for the whole English-speaking world, including America. The Church of Scotland was fully persuaded of the validity of its orders and believed it had something of value to contribute to the wealth of the united Church. The practical difficulties are very great, but nothing is too hard for a steadfast faith. It could accept the historic episcopate of the Church of England with some adaptations, but it would hold fast to its system of church courts and to its lay eldership. The union could be accomplished on the fourfold basis of (1) the Holy Scriptures, (2) the Apostles' and Nicene Creeds, (3) the sacraments of baptism and the Lord's Supper, and (4) the historic episcopate.

WAR SERVICE OF RELIGIOUS ORGANIZATIONS

War Service of the Churches.—The Churches of all denominations, Protestant, Catholic and Jewish, have been in the forefront of religious, moral, social and intellectual service among and for the armed forces of the United States in camp, in transit, in fleet, in trench, and on the battlefield. All have given hearty support to the American Red Cross, contributing to its funds directly and indirectly, furnishing chaplains and other agents for its ministrations to the wounded, to soldiers in transit, and to the destitute populations in the war areas and refugees and needy families of men in uniform.

General War-Time Commission.—Under the auspices of the Federal Council of the Churches of Christ in America, the General War-Time Commission, which is a body of over one-hundred persons chosen from the different religious agencies that are dealing in direct and responsible ways with the new problems that the war has raised, aims to serve as a clearing house of information and also to afford the denominational commissions with a means of common expression. It has been interested in securing an increase in the number, status and opportunities of the chaplains, for whom a training school has been provided by Government action, and has established a depot for equipment. Surveys have been made of the religious forces in camp neighborhoods, of hospitals, of war-production communities, leading to greater coöperation among the Churches and the several war agencies in or near such localities. The welfare of Negro troops and of the communities from which they come has received considerable attention. Among the more important lines of its work also is its provision for the recruiting and training for Christian service of men with the colors.

Baptist.—The Northern and Southern Baptist Conventions have had strong commissions at work, looking after the interest of our forces in this country and abroad, raising and expending hundreds of thousands of dollars for this purpose. They have contributed their quota of chaplains to the Army and Navy, and have provided camp pastors for the men in training in this country, and taken up such war work as other denominations have conducted.

Congregationalist. — Congregationalists have had a strong organization for war work and have taken their full share of the care of the men at the front abroad and in the camps at home, expending many thousands of dollars in support thereof.

Disciples of Christ.—The Disciples of Christ have been very active in war work, furnishing chaplains for the United States forces and pastors for the camps and engaging in relief work.

Friends.—The Society of Friends, who are opposed to war on principle, in coöperation with the Friends of England have maintained at the request of the French Government a unit in France comprising 412 men and women, including 185 from England. An initial force of 100 carpenters, farmers, civil engineers, architects, mechanics, doctors and social workers were gathered at Haverford College and trained for overseas service. The unit has erected in France portable wooden houses and has constructed villages and hospitals outside the war zone for refugees. It is establishing an experimental farm in France and helping the peasant in his agricultural pursuits, furnishing labor, seed and machinery. Eight hospitals are maintained. The expenditures have amounted to nearly $400,000, to which several branches of Mennonites contributed. The Mennonites, like the Friends, are non-resistants, but are glad to do relief and reconstruction work. Five Friends are serving as chaplains in the Army.

Lutheran.—The National Lutheran Commission represents all the various Lutheran bodies. Eighty-one chaplains have been supplied for the Army and the Navy and 150 pastors for work in the camps. The Commission employs seven secretaries, and has issued an Army and Navy service book and other literature for the soldiers. The Lutheran Brotherhood has erected a number of camp buildings, and the Commission has united with other denominations in providing such conveniences as have been found necessary. The spiritual care of interned aliens was committed to the Commission. The Commission had a financial drive in February, asking for $750,000 and securing $1,300,000.

Methodist.—The Methodist Episcopal Churches, North and South, both have war commissions. The former had 53 camp pastors working in the camps in this country. It has assisted churches in the vicinity of camps in the care of the soldiers, reconstructing some of the churches for this purpose and erecting hostess houses, which have been in the care of the Woman's Home Missionary Society. There are 254 chaplains furnished by the Church to the Army and the Navy. The Commission provides chaplains, in addition to the equipment given by the Government, with $150 for uniform and $150 for work among the soldiers. It has expended over $500,000. The Methodist Episcopal Church, South, has a commission which is active in camp and camp zone and also abroad among the men at the front. It asked the Church for $1,000,000 for the year.

Presbyterian and Reformed.—The Presbyterian Churches, North, South, United and Cumberland, and the two Reformed Churches in the United States have active commissions engaged in war work, raising all the necessary funds for an energetic prosecution of the various forms of war work in camp, at the front and for relief. They have furnished their quotas of chaplains for the Army and the Navy. The National Service Commission of the Northern Presbyterian Church expended about $130,000 for its work among men of the Army and Navy. It equipped 140 chaplains, supported 105 camp pastors, assisted churches near 15 of the camps, and provided evangelists, speakers and singers for tours and occasional work.

Protestant Episcopal. — The war activities of the Protestant Episcopal Church in 1918 were so considerable as somewhat to embarrass the parochial work, a very large number of the clergy being taken for chaplains, official and unofficial. Bishop McCormick, of Western Michigan, was sent to France jointly by the Red Cross and the Episcopal War Commission to superintend all Red Cross chaplaincies and to direct all the war activities of the Episcopal Church in Europe. It was subsequently arranged that Bishop McCormick and Bishop Perry, of Rhode Island, should divide these duties between them, each remaining in the field for a period of about six months and then returning to this country. The War Commission sent civilian chaplains to most of the American camps in this country, in many cases supplementing their work by lay representatives as well, and supplying both salary and equipment for them. At the initiative of the War Commission similar commissions from several other denominations are coöperating with it in furnishing automobiles to a considerable number of chaplains in France.

Chaplains.—A great number of chaplains have been appointed from the various denominations, including some that have never been represented in the Army or Navy before in this way. The Friends have three chaplains, the Christian Science Church has been recognized, and the Church of Jesus Christ of Latter Day Saints (Mormons), the Jewish Church, and others. The whole number appointed is 1,686, of whom 1,166 are Protestants, 557 Catholics, and 13 Jewish.

Religious Susceptibility of Men in the Army.—Camp pastors, chaplains and others who have preached to the soldiers in training camps and on the battle front bear testimony to the fact that they are very generally respectful, attentive listeners to appeals to their religious nature and show a readiness and willingness to declare their faith in God and his providence. The men, regulars and raw recruits, come from all classes of society, from city slum and millionaire row, from mining and lumber camps and farm and factory, from machine shops and colleges, some accustomed to church and Sunday-school, and some strangers thereto; but all seem ready to hear straightout Gospel preaching in which love, faith and hope have a place. Exhortations to virtuous lives, the shunning of degrading and demoralizing vices are not, it is said, deemed deadly dull, but are accepted as wise and helpful.

Young Men's Christian Association.—Under the International Committee of the Y. M. C. A. (347 Madison Avenue, New York City, John R. Mott, general secretary) there are 2,193 associations, with 80,385 Christian laymen serving as directors, 4,936 paid officers, and 673,790 members. The net property and funds of the movement amount to $107,707,200, and its operating expenses for the year 1917 were $24,777,800. The Association found situations for 76,042 men; it gathered 81,899 in educational classes and 117,391 in regular Bible classes, and secured 32,536 decisions for the Christian life, 6,434 uniting with various Churches. The foreign work, with its 450 employed officers, exceeded that of all preceding years in results obtained.

When the United States entered the war in April, 1917, the Association leaders called for $3,000,000 to provide Association privileges for enlisted men during the summer of 1917, and received $5,000,000. The regular work was developed rapidly among the camps and cantonments in America, and so satisfactory was this service and so rapidly did the need for it expand with the rapid increase of men called to the colors, that the National War Work Council asked in November, 1917, for $35,000,000 to provide for this service until July 1, 1918. This call met with a response of over $50,000,000. Up to August, 1918, the bulk of this Association war work was in America, but from that time on a steadily increasing and much larger work has been overseas to maintain the morale-building influence, not only of two million of our men, but also to provide this service as far as possible to meet the request of the French Government for the French Army, of the Italian Government for the Italian Army, and for other countries and for the vast numbers of prisoners of war. There were on Nov. 1 over 6,000 war-work secretaries overseas, in addition to 3,000 such secretaries in camps in America. This service to strengthen the morale and character of the men in the Army and Navy cost the Association about $7,000,000 a month and was of necessity steadily increasing. The United War Work Campaign on Nov. 11-20, called for $170,500,000, of which $100,000,000 was for the Association for the next nine months, the rest being for the Y. W. C. A., the Knights of Columbus, the Jewish Welfare Board (see *Judaism, infra*) and three other causes. The response afforded over $200,000,000 to these organizations. The Y. M. C. A. hut is the soldiers' library, lecture hall, university and club. It is his church, theatre and home. All the elements that are best in army life come inside its walls under the sign of the red triangle.

Young Women's Christian Association.—The Y. W. C. A. has 275 office and field secretaries and 373,599 young women in its membership. It conducts among the young women of India, China, Japan, South America and Turkey the same kind of work as it does in the United States, with a staff of 81 foreign secretaries. The War Council, organized in June, 1917, is concerned with the welfare and morale of girls and women as affected by the war. It has built 67 hostess houses in Army and Navy camps for white and colored and 38 houses are under construction. It has provided 10 emergency housing centers and opened 145 clubs and recreation centers. It has furnished 800 women war workers and organized 714 patriotic leagues with 420,000 members. It has started 25 international institutes for foreign-born women and created several industrial war centers. In France it has operated 12 hostels for American women in war work, conducted 16 social centers for nurses in American base hospitals, furnished 15 foyers for French munitions workers, and directed five outdoor recreation centers for French women.

Knights of Columbus.—The war work of the Knights of Columbus, Roman Catholic, originally intended to be an enlargement of its service as conducted for the benefit of the American troops on the Mexican border in 1916-17, rapidly grew to be an important part of the fabric of war-relief machinery created under Government authorization. They limited their means of support at the outset to their own membership and to the Catholic people of the country, though they worked for all fighting men without distinction, but being pressed for funds, they were compelled to quadruple their budget for the first year of war work. Soldiers and sailors of all denominations have from the first had free use of the buildings provided by the Knights for recreation and amusements. Tons of supplies (chocolate, cigarettes, stationery, etc.,) have been distributed and a fleet of motor trucks and cycles maintained. In the camps at home and in the trenches abroad the Knights of Columbus have about 450 secretaries and 44 huts, distributed at all points where there are American troops and at all debarkation ports. Club headquarters are maintained in London and Paris. Besides the numerous well equipped buildings in France, huts are opened at strategic points in England for the Americans in training there, and war work was extended to Italy. In every camp in this country there is at least one, in some from two to four, buildings of the Knights, and 550 secretaries are in service. The organization maintains a corps of 30 chaplains abroad. They go with the men everywhere. The Knights appealed to the public with other organizations for funds in the United War Work Campaign.

Salvation Army.—The Salvation Army began its war work among

American troops in the first weeks of America's participation in the great struggle, but owing to lack of funds made but slow progress until the opening of 1918, when war-fund drives provided the necessary means. Officers of the Salvation Army have been with the American troops in all their important engagements, and their ministrations have been approved by both the civil and the military authorities. The representatives of the Salvation Army in the front lines have lived and worked in dugouts, wine cellars and partly demolished buildings, making as they could, a home for the soldiers. Among the officers were both men and women. Officers sent to France number 150; other employees, 50; officers and employees in camps in the United States, 65; at headquarters, 40; chaplains in the Army, 5; huts in France, 50; huts in this country, 17; ambulances in service, 34; rest and reading rooms, 40; hostels for soldiers and sailors in France, England and the United States, 14.

American Bible Society.—Between April 6, 1917, and November 11, 1918, the American Bible Society issued in special bindings for the Army and Navy over 4,000,000 Bibles, Testaments and portions. When orders now being filled are completed, the total issues will exceed 5,100,000. Practically half have been vest-pocket Testaments, the great bulk of which have been in English, but 450,000 were printed in nine European languages for men in the United States service who use those languages. Over 1,500,000 Scriptures have been supplied for the military and naval forces of other nations during the war. Even with this tremendous output the supply has never been up to the demand.

JUDAISM

Abram S. Isaacs

Jewish Population in the United States.— According to the *American Jewish Year Book* for 1918-19, after an exhaustive study of the data, the Jews in the United States number over 3,300,000, of which New York City can claim 1,500,000. They have more than 2,200 congregations, and 180 religious schools with 41,903 pupils, exclusive of about 14,000 who attend public schools. They have over 100 recreational and cultural agencies, more than 1,000 mutual-aid societies, 965 lodges, 193 economic agencies, and 164 philanthropic and correctional agencies. Nine cities exclusive of New York, with an aggregate of 9,200,000 inhabitants, contain 900,000 Jews. These are Chicago, 225,000; Philadelphia, 200,000; Cleveland, 100,000; Boston, 77,500; St. Louis, 60,000; Baltimore, 60,000; Newark, N. J., 55,000; Detroit, 50,000. The year's appointments of Jewish commissioned officers in the United States Army number over 1,500.

The B'nai B'rith.—The diamond jubilee of the Order of B'nai B'rith, organized for "benevolence, brotherly love, and harmony" on Oct. 13, 1843, was held in New York in 1918. B'nai B'rith has done much to unite the Jews of all classes, and has made notable contributions to charity and education. It consists to-day of 11 districts, 400 lodges, and a membership exceeding 40,000. Its branches extend to England, Germany, Austria, Bulgaria, Turkey and Palestine. It has erected and supports a Home for the Aged and Infirm at Yonkers, N. Y.; orphan homes at Cleveland, Atlanta, Erie, New Orleans and San Francisco; a Hospital for Consumptives at Denver, and a hospital at Hot Springs; and a manual-training school and a free employment bureau at Chicago. A statute of "Religious Liberty," by Ezekiel, in Fairmount Park, Philadelphia, was given to the people of America at the Centennial in 1876. B'nai B'rith has been a centre of activity for 75 years, national as well as international, and has no other purpose than the welfare of Israel and humanity.

Zionism.—Mr. Balfour's declaration for the British Government, issued on Nov. 2, 1917, that "His Majesty's Government views with favor the establishment of a national home for the Jewish people, and will use its best endeavors to facilitate the achievement of this object" (*A. Y. B.*, 1917, p. 697), gave a decided impetus to Zionism, as it was followed by similar favorable statements by officials of other countries—France, Italy, the United States. A British commission, headed by Dr. Chaim Weizmann, a chemist, reached Palestine on April 10, and soon after the cornerstone of the University of Jerusalem was laid. Primary and secondary schools in Palestine are resuming their activity, as well as the Bezalel school for arts and crafts. Norman Bentwich has been appointed judge of the Court of Appeals in Jerusalem. A preparatory fund of $1,000,000 is being raised for beginning the work of restoration in the towns and colonies of Palestine.

Notwithstanding the action of the British Government, a League of British Jews has been formed in England against the statement that Palestine is the Jewish homeland as a reflection on their British citizenship. In the United States, the Central Conference of American Rabbis, at its convention on July 4, declared that "the acceptance of Palestine as a homeland for the Jewish people" was contrary to the mission of the Jew, who "is to witness God all over the world." The Conference, with over 200 members, includes the entire liberal element in the American Jewish ministry. A special league was proposed for active protest against Zionism, but in view of the fact that the Zionist project is favored by the Allies and there is urgent need of some place of refuge for a million and more Jews made homeless by the war and long continued persecution in certain lands, open opposition has been withdrawn for the present. As a sidelight on the movement, an American Catholic paper warns against "enthroning the Jew in the shrine of Christendom," a foretaste of what is likely to happen if a Jewish state is founded instead of a government under British or international sovereignty, with civil and religious freedom for all.

Jews and the War.—In common with the various creeds and sects who have displayed such remarkable teamwork in winning the war for our country and its Allies, American Israel in 1918 continued and enlarged its work of the preceding year (*A. Y. B.*, 1917, p. 695). The Jewish Relief Fund before the close of 1918 expected to complete its $10,000,000 fund for the sufferers abroad, in addition to the large amounts given to the Red Cross and other general agencies by individual Jews. It is estimated that fully 225,000 men have been furnished to the Army by the American Jewry. Their morale is taken care of by the Jewish Welfare Board, which coöperates with the other leading agencies. In addition to recreational and athletic work, the Board specializes in Americanizing the many young Jewish men who have not been in America long enough to acquire our ideals as citizens.

A vital work of the Board, which is largely the task of the Young Men's Hebrew Association and associated societies, 370 in number, is to bridge divergences between Jewish and non-Jewish soldiers, safeguarding the religious rights of the former while bringing them into better understanding with their Christian comrades. More than fifty huts are in operation, and a hundred additional units are planned. The workers in home camps number 200, and a hundred men and as many women are being sent overseas. Jewish chaplains are rapidly increasing abroad, many of the young rabbi's giving up their positions to enlist either as chaplains or workers during the war. A Y. M. H. A. was established in France among the Jewish soldiers in the 26th Division, holding Holy Day service in small synagogues in rest villages or in dugouts in the actual front.

Reconstructing Old World Jewry.—American committees that have raised $20,000,000 in three years for the aid of the Jewish war sufferers abroad are now planning a $10,000,000 campaign to help the four to six million Jews in Russia, Rumania, Poland, Palestine, Serbia, Greece, etc., who are practically destitute, and for whom new homes, schools, etc., will have to be provided after the war. Commissions of experts will be sent abroad to visit the lands to be aided. The scope of the work includes immediate supplying of food, clothing, shelter and medical attendance, vocational and technical training, repartriation of refugees, extension of free loans without interest to the deserving to engage in useful occupations, supplying of raw materials needed for industries, labor employment, support of schools and synagogues, and return to the United States of American citizens exiled through the war in enemy and neutral lands. A special congress was held on Dec. 15 at Philadelphia to consider how to secure proper recognition of civil and religious freedom for the Jews at the Peace Conference.

Necrology.—The deaths during 1918 include: Profs. Adolf Baginsky and Herman Cohen, Berlin; Alphonse Levy, painter, and Moise Schwab, scholar, Paris; A. M. Luncz, writer, Jerusalem; M. Gudemann, rabbi and author, Vienna; Alfred de Rothschild, London; Pacifico Ascarelli, Naples, its first Jewish councilman (1891); Max Rosenthal, painter, Philadelphia.

RELIGIOUS BODIES IN THE UNITED STATES IN 1917[1]

Denominations	Bodies	Ministers	Churches	Communicants
Adventists	6	1,521	2,834	117,569
Baptists	14	44,694	59,337	7,003,579
Brethren (Dunkards)	4	3,687	1,271	128,363
Brethren (Plymouth)	4	......	403	10,566
Brethren (River)	3	224	105	4,903
Buddhists	2	15	24	3,165
Catholic Apostolic	2	33	24	4,927
Eastern Orthodox	7	396	470	490,500
Catholic Roman	3	20,477	15,904	14,849,003
Christadelphians	......	......	70	1,500
Christian Church	......	1,066	1,360	106,159
Christian Catholic (Dowie)	......	35	17	5,865
Christian Union	......	365	330	16,825
Church of Christ, Scientist	......	3,138	1,569	....
Churches of God (Winebrenner)	......	441	514	28,575
Church of God & Saints of Christ (Colored)	......	75	48	1,823
Churches of Living God (Colored)	3	101	68	4,286
Churches of New Jerusalem	2	131	146	9,772
Church Transcendant	......	2	3	148
Communistic Societies	2	......	13	1,989
Congregationalists	......	5,660	6,089	807,993
Disciples of Christ	2	8,201	11,505	1,387,934
Evangelical Association	2	1,576	2,544	209,483
Faith Associations	9	241	146	9,572
Free Christian Zion Church (Colored)	......	20	15	1,835
Friends	4	1,379	963	119,263
Friends of Temple	......	3	3	376
German Evangelical Protestant	......	59	66	34,704
German Evangelical Synod	......	1,095	1,419	379,964
Independent Congregations	......	267	879	48,673
Jewish Congregations	......	1,084	1,769	143,000
Latter-Day Saints	2	4,460	1,748	420,000
Lutherans	18	9,823	15,517	2,460,937
Mennonites	12	1,521	828	66,542
Methodists	16	42,176	62,954	7,782,018
Moravians	2	146	146	22,535
Nonsectarian Bible Faith	......	50	204	6,396
Pentecostal	2	1,011	1,013	36,119
Presbyterians	11	14,124	16,372	2,225,879
Protestant Episcopal	2	5,704	8,200	1,083,366
Reformed	4	2,244	2,808	514,061
Reformed Catholic	......	7	6	3,250
Salvation Army	......	3,072	970	29,026
Scandinavian Evangelical	3	661	586	62,900
Schwenkfelders	......	6	6	1,126
Social Brethren	......	15	17	1,262
Society of Ethical Culture	......	7	6	2,450
Spiritualists	......	......	1,500	200,000
Theosophical Society	......	......	187	7,002
Unitarians	......	504	472	71,110
United Brethren	2	2,220	4,066	367,959
Universalists	......	675	868	58,942
Total, 1917	167	184,413	228,382	41,234,234
Total, 1916	171	182,805	226,756	40,487,790
Net increase	....	1,608	1,626	746,444

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[1] Prepared by H. K. Carroll.

XXVIII. ART, ARCHITECTURE, MUSIC, AND DRAMA

PAINTING, SCULPTURE, AND HANDICRAFTS

WILLIAM B. M'CORMICK

The Art World and the War.—The second year of our participation in the European war had a more general effect on the art world and our artists than in any twelvemonth since 1914. The coal shortage brought about the complete closing of many museums throughout the country and the shortening of the exhibition hours in others. The extension of the draft ages under the Selective Service Act called so many men to the colors that one organization, the Society of Independent Artists, stated that 50 per cent. of its members were either at the front or in the training camps. Patriotic work, in the painting of designation targets for musketry and machine-gun training, in the form of poster designs and outdoor advertising painting, and in preparing schemes for the Liberty Loan campaigns engaged the interest of painters and sculptors to such an extent that most of the regular exhibitions suffered from lack of interesting works. The Corcoran Gallery of Art announced in April that it would abandon its customary annual exhibition in December "in view of conditions resulting from the war," and the National Arts Club of New York City likewise abandoned an exhibition in May. At the request of the Corps of Engineers, U. S. Army, a committee of artists and architects selected eight painters and illustrators in March to make a "complete official pictorial record of the American Army's participation in the war." The men selected by the committee were J. André Smith, etcher; Walter J. Enright, illustrator; Harvey Dunn, painter; Walter J. Duncan, illustrator; William J. Aylward, illustrator; Harry Townsend, painter; Wallace Morgan, illustrator; and Ernest C. Peixotto, painter. As a part of the Fourth Liberty Loan campaign, a committee of artists and architects in New York arranged an art exhibition for the shop windows along Fifth Avenue from Twenty-third to Fifty-ninth Streets and combined with this a scheme of decoration with flags and banners meriting the adjective of superb.

The ninth annual convention of the American Federation of Arts was held in Detroit, May 23-24, and was chiefly devoted to discussions of industrial art and its cultivation in the United States. It was announced in October that T. B. Walker of Minneapolis had presented his collection of art to that city, together with three acres of land for a new public library. Mr. Walker's collection includes 600 paintings, Oriental and antique pottery and porcelains, jades and bronzes. It was announced on Dec. 14 that Christoffer Hannevig of New York City had organized the American Portrait Foundation of 1918 for the formation of a collection of portraits to be the foundation of a national portrait gallery, the nucleus of which was to be 25 portraits, 12 of the first group to be the work of American artists. The fund has been stated to be $100,000.

Museums.—Foremost among American museums in the efforts made to foster industrial arts in the United States, the Metropolitan Museum of Art opened a new department devoted to this work in September. The Museum also entered into the work of the war by allowing the curator of arms and armor, Dr. Bashford Dean, a leave to enter the Army for the purpose of designing models for modern armor for our troops abroad, much of this work being done in the Museum by Daniel Tachaux, a French armorer, who is one of the Museum's staff. In June the entire J. P. Morgan collection of art objects, presented to the museum in 1917 by his son (*A. Y. B.*, 1917, p. 700), was shown assembled in one wing of the building now called the Pierpont Morgan Wing. On March 11 there was opened a memorial exhibition of the paintings of the late Albert P. Ryder, and also one of American sculptures, the latter to be a permanent feature. At the Degas sale in Paris in May there were purchased for the Museum two portraits by Ingres of M. and Mme. Le Blanc, the price paid being about $60,000.

The Art Institute of Chicago received by request art works left by Mrs. Potter Palmer valued at $100,000. The Cleveland Museum of Art received a bequest of an endowment of $100,000 from Mrs. Charles W. Harkness of New York City and her collection of paintings and china. From Mr. and Mrs. William Preston Harrison of Chicago the Los Angeles Museum of History, Science and Art received a gift of a collection of 28 paintings by contemporary American artists. The thirteenth annual exhibition of paintings by American artists was held in the City Art Museum of St. Louis in October, being limited to 79 works and having for its jury of admission the directors of the Carnegie Institute, the Chicago Art Institute and the Toledo Art Museum, this furnishing a novelty in art juries. In the Brooklyn Institute of Arts and Sciences there was shown (Feb. 5-May 26) the collections of modern paintings from France and Belgium that formed the art exhibitions of those countries at the San Francisco Exposition in 1915. In November there was also shown in the Brooklyn Museum a large group of the works of Boris Anisfeld, a Russian painter, that was later shown in other museums throughout the country. An art museum primarily for children was opened in Boston in August, consisting of a one-story brick building to be devoted to showing pictures that will appeal to children, its first exhibition being made up of loans. Bequests announced during the year included $1,600,000 to the Metropolitan Museum of Art from Mrs. Olivia Sage, $100,000 each to the Boston Museum of Fine Arts and the Fogg Art Museum of Harvard University by the will of Hervey E. Wetzel; and $50,000 from the estate of Mrs. George N. Colver and $500,000 from the estate of George B. Harris to the Art Institute of Chicago.

Exhibitions.—The regular annual exhibitions of the various art organizations in the United States during 1918 were for the most part spiritless and featureless and were more representative of a desire to keep a tradition alive than displays of a virile art feeling. The 119th annual exhibition of the Pennsylvania Academy of Fine Arts opened on Feb. 2 with 515 paintings and 113 works of sculpture, a feature of the catalogue being the total absence of the names of our artists living abroad. To George Luks was awarded the Temple gold medal for his *genre* painting "East Houston Street, New York"; Leopold Seyffert won the Beck gold medal for a half-length portrait of Fritz Kreisler, the violinist; Helen K. McCarthy won the Mary Smith prize for her landscape, "Farms in Hill Country"; the Jennie Sesnan gold medal went to J. Alden Weir for a landscape, "A Bit of New England"; and the George D. Widener memorial medal was awarded to Albert Laessle for his studies of penguins. The gold medal of honor was awarded to John McLure Hamilton, and the Lippincott prize was given to DeWitt M. Lochman for his figure study, "The Blue and Gold Kimono." The 33d annual exhibition of the Architectural League in New York City (Feb. 2-23) marked another effort of the organization to encourage other arts than architecture, for chief among its exhibits were ceramics, floor coverings, textiles, furniture and other materials that enter into the decoration of the interior of houses, the whole being varied and interesting. The prize for architecture went to Benjamin Wistar Morris for his Baldwin residence in Mt. Kisco, N. Y.; to Paul W. Bartlett went the medal for sculpture for his youthful Bacchus; the Avery prize for sculpture was awarded to Rapheal Menconi; and that for a collaborative scheme to George Licht, architect, Rapheal Menconi, sculptor, and F. K.

Gates, mural painter. The 93d annual exhibition of the National Academy of Design (March 12-April 21) showed more plainly the dispiriting effects of wartime conditions than any show of the year. Although 370 paintings and 47 works of sculpture were shown, there was no marked character to the display except that of "war weariness". The first Altman prize went to Paul Dougherty for his coast scene (painted some years ago) called "Bottalack Cove"; the second Altman prize to Childe Hassam for his "Flag Day, Fifth Avenue", a brilliant reaction to one of New York's patriotic displays; the Thomas B. Clarke prize fell to Walter Ufer for "Going East", a study of Indians; and the Inness gold medal was awarded to Howard Giles for his "Maine Woods". The Saltus medal for merit went to Joseph T. Pearson, Jr., for his "Spring"; the Isaac F. Maynard portrait prize to Lydia Emmet for her "Tell Me a Story". The three Hallgarten prizes went respectively to Leopold Seyffert for his portrait of his wife, to Lamar Raditz for a self-portrait, and to Felix Russman for a still life, "The Black Bottle". The 42d annual exhibition of the San Francisco Art Association held in the Fine Arts Palace in May brought out 369 exhibits in painting, sculpture and the graphic arts, and 218 architectural designs. The Emanuel Walter prize was awarded to Henry V. Poor for a landscape; the Charles T. Crocker prize to Clark Hobart for his portrait of Mrs. Francis Young; the gold medal for painting to Joseph Rapheal for a landscape; the silver medal to Armin Hansen for his landscape, "Noon Hour", this artist also winning a silver medal for a drawing. A bronze medal went to Anne M. Bremer for her painting, "Lacquer Screen", a silver medal for a water color to Godfrey Fletcher, and a gold medal for sculpture to Ralph Stackpole. In September there was opened in Chicago an exhibition of 2,000 war pictures by French soldier-painters that was scheduled to make a tour of St. Louis, Springfield, Ill., and other cities of the Middle West before reaching the Atlantic coast towns. The contributing painters numbered 86 and the exhibition was well representative of contemporary French art. Gifford Beal won the $1,000 cash prize and gold medal given by the National Arts Club of New York City at the annual exhibition held in January. At the Winter Exhibition of the National Academy of Design (Dec. 11-Jan. 12, 1919) Victor Higgins won the first Altman prize for an Indian picture, "Fiesta Day"; Leopold Seyffert the second Altman prize for a figure study, "Lacquer Screen"; John F. Carlson the Carnegie prize for his landscape, "Winter Rigor"; Louis Betts the Thomas R. Proctor prize for a portrait of his wife; Adolphe W. Blondheim the Isidor medal for a figure composition, "Decoration No. 3"; Evelyn B. Longman the Julia A. Shaw prize for her sculptured nude, "The Future"; Charles Grafley the Elizabeth N. Watrous gold medal for a bust portrait of Childe Hassam; and Jess M. Lawson the Helen Foster Barnett prize for her sculpture, "Belgium, 1914".

Sculpture. — Only six works of sculpture of importance were emplaced during 1918, these being A. Stirling Calder's heroic figure of Washington as the general of the Continental Army, which was added to the decorative features of the Washington Arch in New York City in February without any attendant ceremonies; a replica of Daniel Chester French's "Republic," unveiled in Jackson Park, Chicago, on May 11, the original having been one of the sculptural features of the World's Columbian Exposition in that city; Gutzon Borglum's seated figure of Dr. Edward L. Trudeau, which was unveiled at the Trudeau Sanatorium, Saranac Lake, N. Y., on Aug. 10; and Andrew O'Connor's heroic standing figure of Lincoln, placed in front of the Illinois State Capitol at Springfield. As a result of the revulsion of feeling against all things German in the United States, the statue of Frederick the Great that had stood in front of the War College in Washington since 1904 was removed from its pedestal and stored away in the cellar of that institution, and the statue of "Germania" by Albert Jaeger on the façade of the Custom House in New York City was transformed into a figure typifying Belgium by cutting away the word "Kiel" on the shield before the figure and substituting a modern Belgian soldier's helmet for the winged helmet formerly worn. The statue of Edwin Booth by Edmond T. Quinn, the only statue of an actor ever erected in New York City, was unveiled in Gramercy Park on Nov. 13. It represents the actor in the character of Hamlet just rising from a chair. A life-size statue of James Whitcomb Riley, by Myra Reynolds Richards of Indianapolis, was unveiled at Greenfield, Ind., on Nov. 26.

Handicrafts.—The most important feature of the handicrafts section of America's art world was the practical acceptance of many arts and crafts workers to take up the study of occupational therapy with a view to aiding in the work of rehabilitating wounded American soldiers by teaching them trades or occupations that would make them self-supporting. First of the schools to be formed as the outcome of a suggestion made by the Arts and Crafts Guild of Philadelphia was the Philadelphia School for Occupational Therapy, which opened in October. Classes of the same character opened in Boston, New York and other cities were attended by many crafts workers. One of the striking exhibitions of the year was that of designs for postcards held under the direction of the Boston Society of Arts and Crafts in October; a second competition for Christmas cards to be sent to our soldiers and sailors overseas was held in November and December. In February and March the Metropolitan Museum of Art held an exhibition of furniture, jewelry, fabrics, costumes, dishes, glassware and other forms of applied art, all of the designs having been worked out as the result of studies made in the Museum by American designers and craftsmen. In May there was held in the Grand Central Palace in New York City a National Textile Exhibition, arranged to show the progress made in the United States by American designers and weavers, particularly since the war closed our usual European sources of supply of decorative fabrics. As a result of efforts that have been made since 1915 to give the United States a place in the sun of the textile world, a project was started in May to create a Chamber of Industry corresponding in its general character to our chambers of commerce organizations. The Art Alliance of New York City announced three arts and crafts exhibitions for October, November and December, the last being devoted to toys made in the United States.

Medallic Art.—The war and incidents connected with it brought forth several new medals during the year, chief of these being the Distinguished Service Cross and the Distinguished Service Medal which were added to the limited list of such awards for gallantry and service in war that are given by the United States Government. The Distinguished Service Cross accepted by the Government was designed by Capt. André Smith (etcher), Capt. Aymer E. Embury, 3rd, (architect) and Private Gaetano Cecere (sculptor) of the Camouflage Section, Fortieth U. S. Engineers. The cross is of bronze, with an eagle superimposed and the words "For Valor" on a scroll connecting the arms. The Distinguished Service Medal is of bronze with the seal of the United States forming the central design on the obverse with an inscription "For Distinguished Service" and the year 1918 in Roman figures, the reverse showing a standard of flags with a scroll in the center for the name of the wearer. On Aug. 11 the Department of Labor announced that it would issue a United States War Industries Badge for deserving civilian war workers. Jo Davidson modelled the design for the badge, which is circular in shape and suspended from a bar enamelled in red, white and blue; on the obverse is a group composed of a shipbuilder, a munitions worker and an American soldier, the figure of the munitions worker being that of a woman. The badges are to be struck in bronze and silver and are to be presented, respectively, for four and eight months of consecutive work in war labor. The American Numismatic Society issued in March the medal struck in 1917 to commemorate the visits of the British and French Commissions to New York City. The obverse of the medal, designed by Daniel C. French, shows a head of Victory adorned with a sprig of oak, a lily and a cluster of pine needles as emblems of England, France, and the United States, with an inscription reading: "To commemorate the visit to New York of the French and British War Commissions, 1917"; the reverse of the medal, designed by Miss Evelyn B. Longman, shows a group of three figures, Joan of Arc, a mediæval knight in full armor, and American Liberty. Five of the medals in gold were struck for presentation to Rene Viviani, Marshal Joffre, Arthur J. Balfour, Lieut.-Gen. G. T. M. Bridges and the late ex-Mayor Mitchel of New York City. In September the Society announced that it would issue a medal designed by Theodore Spicer-Simson to commemorate the airplane flight across the English Channel made by King Albert and Queen Elisabeth of Belgium to attend the silver wedding anniversary of King George and Queen Mary of England in July. On the reverse of the medal appears the busts of the Belgian King and Queen with the inscription in Latin, familiar in the English, "The bravest of these are the Belgians", from Caesar's *De Bello Gallico;* the obverse shows an airplane flying above the waters. It is proposed to send a copy in gold to King Albert and Queen Elisabeth, silver and bronze copies being struck for subscribing members of the Society.

Necrology.—Henry Golden Dearth, painter and authority on Oriental and Persian art, died in his home in New York City on March 27, aged 58. James Harvey Young, portrait painter, founder of the Boston Art Club, and for some years director of fine arts of the Boston Athenæum, died in his home, Brookline, Mass., on April 24 at the age of 88. David Maitland Armstrong, painter and designer of stained-glass windows, died on May 27 in his home in New York City in his 83d year. Sgt. Everit Albert Herter, decorative artist and a member of the Camouflage Section of the Fortieth U. S. Engineers, died of wounds received in action in France on June 13, aged 26, the first American painter to die as a soldier in the European War. James Craig Nicoll, painter and president of the American Water Color Society, of which he was a founder, died in his summer home at Norwalk, Conn., on July 26 in his 71st year. Lieut. Harry D. Thrasher, of the Camouflage Section, sculptor, and a member of the National Sculpture Society, was killed in action in France on Aug. 11, aged 35. Max Rosenthal, portrait painter and etcher, died in Philadelphia, on Aug. 8, aged 85. Frederic Crowninshield, painter and poet and former director of the American Academy in Rome, died in his home in Capri, Italy, on Aug. 13, aged 73. Elbridge Kingsley, wood engraver, died in Brooklyn, on Aug. 28 at the age of 76. C. S. Pietro, sculptor, and founder of the Friends of Young Artists, died in his studio in Pelham, N. Y., on Oct. 9 in his 33d year. Archibald M. Willard, painter, died in his home in Cleveland, Ohio, on Oct. 11 in his 81st year; he painted many war pictures of the Revolution but he is best known for the canvas "The Spirit of '76", which was first shown at the Centennial Exposition in 1876 and which is now in Abbot Hall, Marblehead, Mass. Parker Mann, landscape painter, died in his home in Princeton, N. J., on Dec. 15, aged 65; and James Renwick Brevoort, landscape painter, in his home in Yonkers, N. Y., on the same day, in his 87th year.

ARCHITECTURE

Richard F. Bach

Effect of the War on Building.—During its entire course the war has exacted heavy toll from the building industries, first by patriotic and subsequently legally imposed curtailments of materials, labor or permitted expenditures, and later by an enforced abandonment of all building calculated to meet other than war requirements; as in so many parallel cases (as, for instance, that of the so-called "pleasure automobile"), the latter was easily settled by the direct line of controlled distribution of raw materials (see also XX, *Civil Engineering*). Not only the architectural field, strictly speaking, but also the allied fields which contribute to home furnishing have suffered severely. Metal trades, glass and china trades, textile industries, and many other accessory branches were practically driven to the wall and deprived of all incentive to the production of new designs, either through the cutting off of coal and iron and their derivatives or through deficiency of importations, such as dyes, woods, etc., with which America never saw fit to supply herself before the great cataclysm brought about our splendid isolation so far as the arts are concerned (see also *Painting, Sculpture, and Handicrafts, supra*).

Both private and public building, therefore, has been at little better than a standstill during 1918 (see also XII, *Building Operations*). Architects have closed their offices; great talents in the field of design have been squandered upon menial, draftsman's duties. Only those architects in Government employ saw any prospect of clearing their overhead charges.

Projected Construction.—The signing of the armistice on November 11 turned the attention of architects, builders and manufacturers of building materials to the vast quantity of suspended building in great part already designed or actually in work when various Government restrictions caused its postponement or interruption. While building enterprises are among the first to feel the shock of war in a financial sense, they are also among the first industries to be reawakened when the clash of arms has ceased. This is due, of course, to the fact that the ramifications of the building industries reach into all fields and materials of manufacture, and immediately affect the purses of prospective builders, due to the proportionately large amounts of readily available cash required.

A recent survey revealed that the close of the year would probably see under way construction projects valued at 500 million dollars. Part of this represents suspended work but the major part is new work. The War Industries Board has removed many of the restrictions against construction; the Fuel Administration has entirely removed all limitations placed upon the use of fuel for the manufacture of building materials. In addition, the Government itself is seriously considering an extensive construction programme having to do with public welfare, housing and improvements of many kinds.

Some of the figures for various cities as represented in the general schedule of proposed construction are of amazing proportions. New York City plans to spend $9,000,000 on schools, $22,420,000 on industrial and office buildings, $11,065,000 on apartment houses, hotels and residences, $23,305,000 on institutional buildings, churches and municipal buildings, and $128,033,000 on industrial and office buildings. Kansas City is preparing to spend $20,000,000 on its general building programme; Detroit, over $50,000,000; Boston, $20,816,000. Cleveland's prospective outlay for institutional, church and municipal buildings accounts for $24,700,000, and school projects amounting to $10,000,000 are reported from Minneapolis for the northwestern states.

War Service of the Architectural Profession. — During the war many architects have given their services as engineers, and the profession generally has an enviable service record in the war as regards the importance granted to men of architectural training in connection with Government projects for housing war workers (see *infra*), and for many other direct or contributory governmental agencies. Architects have figured largely in the working out of plans for war hospitals, camp construction and sanitation, and the like. The housing of workers employed in the many war industries engaged the foremost architectural talent of the land. The American Institute of Architects has repeatedly been called into consultation by the Government.

Federal Buildings.—Before restrictions upon materials became too stringent, a number of building projects which had been begun or which were deemed necessary were permitted to continue to completion. In the almost negligible list of new Federal buildings are to be included the office building of the Department of the Interior, by Charles Butler, and the Hackensack, N. J., Post Office, by J. A. Wetmore, Acting Supervising Architect of the Treasury Department.

Bank Buildings.—In point of actual numbers, banks, schools, and residences are the most numerous groups of new buildings recorded for 1918. Interesting examples among the banks are the usual classic-type structure of the Wayne County and Home Savings Bank at Detroit, by Albert Kahn; the Greek Doric Detroit Savings Bank, by the same architect; the Sixtieth Street Branch of the Guaranty Trust Co. in New York, by Cross & Cross; the American Bank and Trust Co. at New Haven, by Brown & Van Buren; the Metropolitan Bank Building at Minneapolis, by Hewitt & Brown; the First National Bank at Portland, Me., by Coolidge & Carlson; the Hartford Trust Co., East Hartford, Conn., by Walter P. Crabtree; the National Bank of Commerce at Detroit, by Albert Kahn and Ernest Wilby.

School Buildings. — Among the schools are to be noted the brick structure of Italian type of Fernwood Grammar School by Lawrence & Holford at Portland, Ore.; the Spanish-Renaissance type of the Merced Union High School building of Girard College, Philadelphia, by John T. Windrim; the Camden High School, Camden, N. J., by Paul A. Davis; the Maynard, Mass., High School, by Charles R. Greco; and the Garfield School at Toledo, Ohio, by Edwin M. Gee.

Residences.—Among the residences the following deserve attention: the Mrs. Arthur Scott Burden and Middleton S. Burrill residences at Jericho, L. I., and the J. R. Robinson residence at Westbury, L. I., all by John Russel Pope; the J. J. Schullinger residence at Riverdale, N. Y., by Dwight James Baum; the residence of G. D. Blaney at Saratoga, Cal., by Willis Polk & Co., a fine stucco design; the English brick and stucco residence of Harold L. Ickes at Hubbard Woods, Ill., and the home of Cyrus L. McCormick at Lake Forest, Ill., both by Perkins, Fellows & Hamilton; the English Tudor type of residence of George Arents, Jr., at Rye, N. Y., by Louis Colt Albro; the J. W. Harriman residence at Brookville, L. I., by Alfred C. Bossom; the large stucco building for Francis L. Hine at Glen Cove, L. I., by Walker & Gillette; the Geo. Hill residence at Stamford, Conn., by Paul R. Allen; the Frank Bailey residence at Locust Valley, L. I., by H. C. Severance; the R. L. Stevens residence at Bernardside, N. J., by Lord & Hewlett. There were built also good small houses at Villa Nova, Pa., by Wilson, Eyre & McIlvaine, and at Bronxville, N. Y., by Eugene J. Lang.

Library Buildings.—Good examples of libraries completed during the year are the public libraries at Swampscott, Mass., by Kelley & Graves; at Beverly Farms, Mass., by Loring & Leland; the Converse Memorial Library at Amherst, Mass., by McKim, Mead & White; the Dailey Memorial Library at Medfield, Mass., by Wm. G. Perry.

Churches. — But few churches of note were erected during the year; the following deserve mention: Wheaton College Chapel, Norton, Mass., by Cram & Ferguson; St. Gregory's Church at North Weymouth, Mass., by Charles R. Greco; First Church of Christ, Scientist, at Palo Alto, Cal., by Elmer Grey; and St. Mark's Church, Minneapolis, by Hewitt & Brown. Some progress was also made on the buildings for St. John the Divine under direction of Ralph Adams Cram, and for St. Bartholomew's under direction of Bertram G. Goodhue, both in New York. To these should be added St. Joseph's Convent at Roxbury, Mass., a brick structure of mediæval inspiration, by Charles R. Greco.

College Buildings.—During the year there were completed collegiate buildings as follows: Benjamin Ide Wheeler Hall at the University of California, by John Galen Howard; the Civil Engineering Building at John Hopkins University, by Joseph Evans Sperry; and the Loomis Institute Founders' Building at Windsor, Conn., by Murphy & Dana. Mention should also be made of the extensive plans for the Yale Memorial Quad by James Gamble Rogers, a large collegiate Gothic project.

Hotels, Museums, Theatres, etc.—Hotels, museums, secret societies, theatres, are poorly represented among the new structures of 1918. Mention might be made of the Fort Shelby Hotel at Detroit by Richard E. Schmitt, Garden & Martin, and of the Hotel Statler at St. Louis by Geo. B. Post & Sons and Mauran, Russel & Crowell. The Metropolitan Museum of Art, New York, added an important classic sculpture wing by McKim, Mead & White, and at Oberlin, Ohio, was built the Allen Memorial Art Building by Cass Gilbert, a well ordered design. Note should be made of the new Masonic Temple at Salem, Ore., by Lawrence & Holford, a kind of Hispano-Italian suggestion; the simple brick Alpha Tau Omega house at Berkeley, Cal., by Wm. C. Hays and Norman W. Shaw; and the stucco Phi Delta Theta house at the University of California by John Ried, Jr. The harmless design of the Henry Miller Theatre, New York, by Paul R. Allen & H. Creighton Ingall, the good English design of the Stillman Theatre in Brooklyn, N. Y., by Thos. W. Lamb, and the mediocre design of the Orpheum Theatre at St. Louis by G. Albert Lansburgh were completed in 1918. American theatres, generally speaking, are the worst representatives of American progress in architecture.

Apartment Houses and Clubs.—Among the first types of buildings to be postponed in war time are club houses, apartment houses, medium-sized residences and theatres. There was in 1918 a serious shortage in apartment-house accommodations; between the profiteering tactics of unscrupulous landlords and the difficulty of obtaining coal, tenants, both actual and prospective, were hard put to it to find or retain quarters in these "rookeries". A few poorly designed apartment houses not worthy of record were completed during the year. Separate mention should be made, however, of an outstanding design by Cass Gilbert for an apartment studio building in 57th Street, New York, an excellent Gothic interpretation of a distinctly modern problem. The most important club building of the year is that of the Racquet and Tennis Club, New York, a fine Italian palace design by McKim, Mead & White. Mention should also be made of the University Club, St. Louis, by Eames & Young and Guy C. Mariner; the half-timber Bob-O-Link Golf Club, Highland Park, Ill., by Brown & Walcott, and the stucco Mission type of the Ravisloe Country Club at Homewood, Ill., by Geo. C. Nimmons & Co.

Office Buildings.—Lack of steel also figured in the forced curtailment of skyscraper buildings and of office buildings generally. Good designs of such structures are seen in the Ditson Building, Boston, by C. Howard Walker and Townsend, Steinle & Haskell; the Recreation Building at Detroit, by Smith, Hinchman & Grylls; and the Consolidated Gas Co. building, 57th Street, New York, by Warren & Wetmore. Other notable examples are: the W. P. Story Building, Los Angeles, by Morgan, Walls & Morgan; the Detroit News Building, Detroit, by Albert Kahn and Ernest Wilby; and the Book Building, Detroit, by Louis Kamper. The excellent Bush Terminal Building, 42d Street, New York, by Helmle & Corbett, was also completed during the year, this and the Recreation Building at Detroit representing two of the most up-to-minute architectural problems capable of solution only through the convenient agency of the skyscraper.

Factory Buildings.—A number of factory buildings, chiefly of hopelessly uninspiring conception, were a natural result of the quick growth of manufacturing resulting from our entry into the war. The following should be noted: H. N. Cook Belting Co., San Francisco, by Ward & Blohme; Sperry Gryoscope Co., Brooklyn, N. Y., by Helmle & Corbett; the Thomas Shoe Co., by the same firm; the Baltimore Oil Engineering Co., Baltimore, Md., by Walter M. Gieseke; the Union Special Machinery Co., Chicago, by Geo. C. Nimmons & Co.; the Lacassian Labratories, St. Louis, by P. J. Bradshaw; the International Tailoring Co., Chicago, by Mundie & Jensen; the Twentieth Century Storage Warehouse, Philadelphia, by Love & Hunt.

Industrial Housing.—The most important contribution of architecture to American progress due to war is seen in the almost fabulous development of housing within the last year. Enormous projects created overnight were made mandatory by the demands for housing shipyard and munition workers. The establishment of new communities was the only feasible solution. The War Labor Board, a Housing Corporation of the U. S. Department of Labor, the Shipping Board and other agencies were interested in this development, and under the direction of the Corporation, in which many prominent architects figured, a large number of projects were begun. A partial record is appended: Morgan Park, Minn., by Dean & Dean; Sawyer Park, Williamsport, Pa., by Geo. S. & Lewis E. Welsh; the Connecticut Development, Bridgeport, by Schenck & Mead; Yorkship Village, Camden, N. J., by E. D. Litchfield; Eclipse Park, Beloit, Wis., by Geo. B. Post & Sons; and many others, sometimes under the auspices of state bodies, such as the Massachusetts Homestead Commission, as seen at Lowell, Mass., in the developments by Kilham & Hopkins; sometimes under the auspices of companies, such as the Merchant Shipbuilding Corporation, as seen in the plan by Mann & McNeill at Bristol, Pa.; sometimes the result of private enterprises, as seen at Elizabeth, N. J., in the plan by Murphy & Dana, or at Flint, Mich., by Davis, McGrath & Kiessling. These projects demonstrated throughout a straightforward simplicity and directness, a homelikeness, and an avoidance of shabby gentility which will stand as a splendid record of achievement and offer undreamed-of opportunities for further development in this very important branch of American effort. (See also VI, *Housing.*)

LANDSCAPE ARCHITECTURE

Aubrey Tealdi

Professional Notes. — During the year 1918 landscape architects have been more and more taken up with the city-planning branch of the profession in connection with war activities. The prominence of the landscape architect in the work of the U. S. Housing Corporation is witness to the importance of the profession to the country at large. In addition to the landscape architects who have served in the Construction Division of the War Department, many others have been engaged as town planners in developing the layouts of both temporary and permanent towns and additions to existing towns for the housing of war workers (see also VI, *Housing*). The recognition by the Government in war time of what landscape architecture stands for in the field of social economics as well as in that of aesthetics is a good augury for the future of the profession.

A special meeting of the American Society of Landscape Architects was held in Washington, Dec. 7-8, to review the work of the profession during the war. A Pacific Coast Chapter of the Society was organized provisionally in May. A committee of the Society joined in the propaganda on food production and gave advice through the press and otherwise with a view to avoiding some of the mistakes of the preceding year. James L. Greenleaf was elected to succeed Frederick Law Olmsted as the landscape-architect member of the Commission of Fine Arts.

A traveling exhibit composed of recent work in landscape architecture is being made available for general exhibition purposes. This exhibit is primarily educational and consists of rendered plans, elevations and sections, perspective drawings and photographs. The subjects included cover the whole range of landscape practice: problems of city planning and residence subdivisions, park and cemetery developments, small home grounds and large estates, gardens of all styles, etc. The exhibit is in charge of John Noyes, American Society of Landscape Architects, Central Bank Building, St. Louis, Mo., from whom complete information may be obtained.

Education in Landscape Architecture.—Instruction in landscape architecture is now given in a number of colleges and universities throughout the country, many of these offering regular four-year courses leading to a bachelor's degree. The Universities of Cornell, Harvard and Michigan offer courses leading to a master's degree. The work at Harvard is exclusively in the Graduate School. At Cornell and Michigan the work is open to women. With the constantly growing importance of the landscape architect in city planning, instruction in this broad field is being emphasized. One of the aims of the professional courses is to help meet the demand in the coming period of reconstruction for men trained to understand and to solve the problems not only of city planning, but of regional and national planning, which can be seen as the ultimate endeavor.

Public and Private Work.—The slackening of landscape work on private places, which a year ago had been particularly noticeable in the East, has been just as marked further west during 1918. While landscape architects have been engaged mainly in Government work, a considerable amount of work of a public nature either has been done or is being planned for execution as soon as conditions permit. A partial list follows: Faxon Field, Quincy, Mass.; Denison Park, Corning, N. Y.; Sanford Park, Springfield, Mo.; Ripley Park, Topeka, Kan.; Lincoln Homestead Park, Springfield, Ill., surrounding the Lincoln Home, to be developed with a suitable approach from the State Capitol; a new 50-acre park in South Bend, Ore.; a waterside park of 9,000 acres, of which 6,000 acres is in the lake made by damming the river, at Fort Worth, Tex.; village for Plymouth Mine, Verona, Mich.; 100-acre subdivision at Duluth, Minn.; 100-acre residence subdivision at Superior, Wis.; general plan for the North Carolina State School for the Blind and the Deaf, Raleigh, N. C.; general plan for the University of North Carolina, Chapel Hill, N. C.; Country Club grounds, Dayton, Ohio; Rosehill Cemetery, New Orleans, La.; New Joplin Cemetery, Joplin, Mo.; a new cemetery at Tampa, Fla.; Fairlawn Burial Park, Hutchinson, Kan.

MUSIC

Frederick H. Martens

General Survey of the Year.—The end of the war came too near the close of 1918 to count in any degree as a factor in the year's musical activity. War conditions and economic conditions, especially in Europe, have been reflected in a smaller creative output and the performance of fewer new works. The United States may be said to have been the leading power in music, as in other fields, during the year. Even here, economic and other disadvantages have not been without their effect on composer, publisher and public. The greatest net result of the year, musically, may be considered to comprise the increasing attention paid the works of American composers; the stimulating in all the military camps and in hundreds of communities, principally through the efforts of the War Camp Community Service, acting for the War Department's Committee on Training Camp Activities, of "community singing" as a recreative and musical factor in the national life (see also XIV, *Recreation*); the steps taken to place the National Army bands on a more regular and satisfactory basis as regards equipment, accomplishment and numbers; and the movement inaugurated by the Musical Alliance of the United States for a wider introduction of music in the public schools of the country. In a number of the cities and war-work centers the War Camp Community Service has also been successfully active in making music *per se* and music in connection with the dance a valuable contribution toward solving the recreative problems of the welfare worker. Music as a business, as distinct from music as an art, has been made to feel (save with regard to music and musical instruments for military use) the disadvantage under which an industry of its type labors during time of war.

Opera.—In the field of opera, although various novelties have been produced both in the United States and abroad, few of them seem destined to hold their own against the older established favorites of the repertory. Henry Hadley's skillfully written and finely orchestrated *Azora* and his lesser *Bianca* did not score the success achieved by Charles Wakefield Cadman's *Shanewis* (New York, March 23); the latter made a frank and happy melodic appeal, and is one of the very few American operas to win a large and definite approval. Mascagni's *Lodoletta* (New York), Sylvio Lazzari's *Sauteriot* (Chicago, Jan. 19), a work full of color and with a fine "Lithuanian" atmosphere, and Liszt's *St. Elizabeth* in operatic guise, though well received, have not been accorded the same spontaneous welcome given the Cadman score, which, though not written as regards technique and construction in the grand-opera manner, as was Hadley's *Azora*, has that direct melodic beauty which is inherent in all operas that hold their place in the repertory. Of Arthur Nevin's *Daughter of the Forest* (Chicago) the less said the better. Mention may be made of the fact that "Victory Night's" operatic contribution at the Metropolitan Opera House, in the general peace celebration on Nov. 11, was Saint-Saëns's *Samson et Dalila*, "commemorating the destruction of Europe's Temple of Dagon by the Hercules of Democracy", with Caruso and Louise Homer at their best. Other operatic Americana of the year were the melodious *Doreya* by the Cuban composer Eduardo Sanchez de Fuentes, *première* in Havana (April), and at the Buenos Aires Colon Theatre, the somewhat monotonous *Tucuman* by the Argentine Felipe Boero.

The greatest operatic success of the year may be said to have been Rimsky-Korsakoff's *Le Coq d'Or*, as staged by Adolf Bolm, who also mimed the *rôle* of King Dodon. An opera-pantomime in the shape of a burlesque and fantastic fairy tale, its wealth of decorative detail in old Muscovite costume and scenery, beautiful dances and expressive pantomimic action, together with music of great charm and rare piquancy of orchestration, presented with a dual cast of singers and dancers, made an instant hit. A lesser and more purely dance production was a ballet adaptation suggested by George W. Cable's *Dance in Place Congo* to the music of Henry Gilbert's symphonic poem of the same title. A rather vague scenario and the incontrovertible fact that only Negroes can convincingly render Negro dances hampered the effect of Gilbert's colorful, exotic music. The closing month of the year saw the world *première* of Puccini's three one-act scores, *Il Tabarro*, *Suor Angelica*, and *Gianni Schicchi* (Dec. 14). Melodramatic, tuneful, taking, they made the customary Puccinian appeal, and were warmly welcomed.

Music in Europe.—In Europe, though graver preoccupations reduced the output of new operas, a surprising amount of activity may be recorded. In England and France a greater breadth of view than that taken in this country allowed the performance of works by non-contemporary German composers on the operatic stage as well as in the concert hall. In Paris César Franck's cantata *Rebecca* was given in operatic form for the first time at the *Opéra* in April. Leroux's effective *1814* had its *première* in May in Monte Carlo, where the Spring season also witnessed an interesting revival of Paisiello's *Barber of Seville*, the favorite of the 18th century as Rossini's was of the 19th. Gunsbourg's new score *Manola* was also given here. Aside from the Mascagni *Lodoletta* (New York) and Marinuzzi's excellent *Jacquerie* (Buenos Aires), Italy's contribution for the year includes a *Mary Magdalen* by Vicenzo Michette, and a very fine work by Montemezzi, *La Nave*. England is represented by Dr. James Lyon's *Storm Wrack*, one-act, no chorus (Liverpool). Germany, aside from a negligible score of the indefatigable Siegfried Wagner, had a *Nueva Commedia* (Cologne) and *Der Stier von Olivera* (Berlin) by Eugen d'Albert, Franz Schmidt's *Notre Dame*, and a *Mary Magdalen* by Koennecke. It is a question whether Sekle's *Scheherazade* announced for the last month of the year will be heard at the Berlin Opera House, although in Bolshevist Russia the Government of the "reds" has liberally subsidized the opera-houses of Petrograd and Moscow. In the symphonic, chamber-music and choral fields, much new music was given in all the European countries during the year. In Russia especially the works of two composers of extreme modernist tendencies, Nicolai Myaskovski and Serge Prokofieff, have excited great interest, and novelty performances of orchestra, quartet and choral music have been frequent in London, Paris, Rome, Berlin, Vienna, *et al.*

Community and Pageant Music.—Community and pageant music has flourished during the year. As was but right and proper, the patriotic note was uncompromisingly sounded in most of it. The New York and Philadelphia "Liberty Sings" were duplicated in a number of other cities, and these unions of soldiers, sailors and civilians for mass singing (30,000 at a time on occasion, as in San Francisco), and the indications that this is no passing phase but rather the beginning of a new, broadly national interest in song, point the way to the use of communal singing as a many-sided factor in general social, as well as musical, development. Public-school music festivals, such as that given in Seattle, Wash., uniting 4,800 children, are also productive of definite result.

Masques and pageants have been plentiful. Among them may be instanced the Springfield *Masque of Illinois* (September), symbolic of the history of the Illinois country, 1673-1918, music by Edward C. Moore; the *End of the Rainbow* masque at Wayne, Neb.; the Minneapolis pageant, *The Torchbearers,* originally written for the War Recreation Bureau for use in cantonments; and the masque of the *Titans of Freedom*, performed at the University of Illinois on Decoration Day to music by J. Lawrence Erb. Characteristic of the new high school interest in this dramatic form was the production of *The Sword of America*, a masque by W. C. Langdon, presented by the Springfield, Ill., High School and its orchestra in May.

Symphonic Music.—The American composer during 1918, as during 1917, was fairly well represented in the list of new symphonic works, though the better part of the new symphonic music written will in all probability not be heard until the 1919 season. Felix Borowski's set of three *Peintures* (Chicago Symphony); George F. Boyle's *Symphonic Fantasie*, distinctive if somewhat inchoate (New York Symphony); Adolf Weidig's *Semiramis*, a well scored symphonic fantasy suggested by a Markham poem (Chicago Symphony); Edward Burlingame Hill's *Stevensonia*, a suite in four movements, well scored and colorful (New York Symphony), are some among the compositions already presented. Nor have European novelties been missing, as witness Villiers-Stanford's tone-poem, *Verdun*, atmospheric of "the smoke of a music-desk Armageddon" (Philadelphia Society); Paul Vidal's graceful *Danse des Ménades and Danse d'Aphrodite* (New York Symphony); Glière's *Ilia Murometz* symphony; and the Modest Altschuler orchestral adaptation of Rachmaninoff's *Russian Easter.* Serge Prokofieff's ultra-modern symphony (Russian Symphony) and Ernest Bloch's *Jewish Cycle* (Friends of Music) must be ranked among the most important symphonic novelties heard in this country during the year. An exotic interest was attached to the concerts given by the talented Japanese composer Koscak Yamada, whose symphonic poems (*The Dark Gate, Madara no hana*) and delightful folk and original songs, as well as their author's mastery as a conductor, scored a great success.

Military Music.—Aside from the incentive given the development of better military bands by governmental action in the United States, the visits and largely attended concerts of such ranking foreign bands as that of the French *Garde Republicaine*, the Royal Italian Band, etc., have been productive of educational results. Among American bands which during the period of the war have attained distinction should be mentioned Sousa's Great Lakes Naval Band, the Hog Island Band, the Philadelphia Orchestra Band, and the Salvation Army Band of New York. A ten-weeks season on the Columbia University campus by the New York Military Band, under the able leadership of Edwin Franko Goldman, presented programmes of standard music, including novelties by composers like Henry Hadley, Percy Grainger, N. Clifford Page, Gustav Saenger, etc.

Choral Music.—The outstanding events of the year in the choral field are easily numbered. They comprise the *première* of Edgar Stillman Kelley's *Pilgrims Progress* at the Cincinnati Festival (May), a long, elaborate and scholarly work for chorus, soli and orchestra, conducted by Eugene Ysaye; the "first time in America" production of Elgar's *Spirit of England*, a glorified occasional number (May), by Walter Henry Hall and the Columbia University Chorus; the Bethlehem Bach Festival (May), at which large audiences gathered to hear the *B-minor Mass*, *My spirit was in heaviness*, *Actus tragicus*, *Magnificat*, and other of the Master's works, presented as only the Bethlehem Bach Choir knows to present them; concerts of the New York St. Cecilia Society at which some of the N. C. Page arrangements of the Burleigh Negro spirituals were heard; the Keene, N. H., performances of Henry Hadley's choral *Ode to Music;* the April concert of the New Choral Society (New York) under Koemmenich's leadership, at which Verdi's *Manzoni Requiem* was splendidly sung; and the country-wide series of concerts given by Father Finn's Paulist choristers under his direction and presenting the best of the older and modern repertory adapted for the boys' voices. Nor should there be omitted such a festival work as David Stanley Smith's *Rhapsody of St. Bernard* (Evanston, Ill., May), one of the most difficult choral works any modern composer has written.

Literature.—The year's list of musical literature includes two books by Daniel Gregory Mason, worthy additions to their predecessors, *Short Studies of Great Masterpieces* (H. W. Gray Co.), admirable analyses of newer and lesser known, though important, symphonic works, and *Contemporary Composers* (Macmillan), a series of essays tracing the connection between social transformation and musical development of the masses, with an excellent study of "Music in America"; some good specific treatises, such as Ernest Fowles' *Harmony in Pianoforte Study* (G. Schirmer), giving the student an idea of structure and harmonic principle through actual playing; *Musical Psycho-Pedantry* by Daniel Bonus (Musical Education Publishing Co.), psychological dogma adapted to the study of music; *The Military Drummer* by Carl E. Gardener (C. Fischer), a manual of drum playing endorsed by the U. S. Government; *Practical Transposition* by Gustave Langenus, "for all players (though primarily clarinetists) using the treble clef"; Carl E. Gardener's *Music Composition* (C. Fischer), a new system of harmony; an excellent *Mastery of Nervousness* (Macmillan) by Robert S. Carroll, M.D., which may be commended to musicians and students on general principles; and *The Bethlehem Bach Choir* (Houghton, Mifflin Co.) by Raymond Walters, a valuable and suggestive treatise on a splendidly American institution. The reference book of the year is the comprehensive *International Who's Who in Music and Musical Gazetteer* (Current Literature Publishing Co.), edited by César Saerchinger, which fills a long-felt want. Cyril Scott has contributed in the essay field, *The Philosophy of Modernism in Its Connection with Music* (London, Kegan Paul); D. C. Parker, a vivid essay, *Percy Aldrich Grainger: A Study* (G. Schirmer); and A. Eaglefield Hull, a volume of 200 pages dealing with *Cyril Scott, Composer, Poet and Philosopher*, a brilliant and constructive critical piece of writing.

Necrology.—The list of those of eminence in the world of music who have died during the year includes: in January, Judith Gautier, daughter of Théophile, the poet, author of many articles in defense of Wagner and Wagnerian tenets; in February, Louise Le Baron, well known American opera singer, Jessie Davis, pianist, Floyd Lyman Hemenway, singer, Wasili Safonoff, celebrated Russian conductor and pianist, and César Cui, Russian composer (symphonic and choral works, songs, chamber and piano music, operas, *Mandarin's Son*, *William Ratcliffe*); Claude Achille Debussy, greatest of French impressionists, in Paris on March 26 (cantata *L'Enfant prodigue*, opera *Pélleas et Mélisande*, many songs, symphonic tone-poems, *Images*, *L'Après-midi d'un Faune*, *La Mer*, many piano pieces); Henry Schradieck, violinist and teacher (studied with Leonard and David, Maud Powell one of his pupils), Brooklyn, March 25; Emil Sjögren, Swedish composer (songs, violin sonatas, piano pieces), Stockholm, March 3; David Thomas Frangcon-Davies, Welsh baritone, London, April 13; Henri Kling, horn virtuoso and teacher (Horn School), Geneva, May 2, Raimund von zur Mühlen, German *lieder* and oratorio singer, May; W. S. Jessop, organist, Sheffield, England, May 15; James Cartwright Macy, composer (anthems, songs), Somerville, Mass., May 25; Arrigo Boïto, composer and poet (opera *Mefistofile*, libretto of Ponchielli's *Gioconda*, Verdi's *Otello* and *Falstaff*), Milan, June 10; Minnie Tish Griffin, concert singer and teacher, Lake Beulah, Wis., June 3; Richard Arnold, distinguished violinist and teacher, former concertmaster, New York Philharmonic, New York, June 21; James Stephen Martin, chorus conductor, Pittsburgh, July 2; Albert Mildenberg, composer and pianist (songs, piano pieces, opera *Rafaelo*), New York, July 3; Gustav Kobbe, music and art critic, author of many books (*Wagner's Life and Works*, *Wagner's Music Dràmas Analyzed*, etc.), Hempstead, L. I., and Edward I. Horsman, Jr., music critic, composer and organist, Somerville, N. J., both on July 27; William Morse Rummel, violinist, Denver, Aug. 10; Dr. H. G. Hanchett, pianist and lecturer, inventor of the *sostenuto* piano pedal, Siasconset, Mass., Aug. 19; George Haupt, American baritone, Florence, and Evan Williams, Welsh tenor, both in May; Oscar Spirescu, Rumanian conductor, New York, Sept. 7; Pierre Gailhard, French operatic basso, Paris, October; Belle V. Godshalk, American soprano, Westfield, N. J., Oct. 6; Harold P. Quicksall, music and dramatic editor of the *North American*, Philadelphia., Oct. 8; Liza Lehmann, famous singer and composer (song-cycle *In a Persian Garden*, *Daisy Chain*, etc.) died in London during the same month, as also Felix Arndt, pianist and composer, New York, and Charles Alexander Lecocq, French operatic composer (*La Fille de Madame Angot*, *Girofle-girofla*, etc.), at the age of 86. On Dec. 21, Cosina Wagner, widow of the composer and "uncrowned queen of Bayreuth," died; and on Dec. 27, Hartridge Whipp, the gifted American baritone, in New York.

THE DRAMA

Louis V. De Foe

The Theatrical Year.—In common with the other arts, the theatre in the United States during 1918 was affected by the war, but to a considerably slighter degree than in the preceding year. The burden placed on its business side by the changed economic conditions which followed this country's participation in the struggle was most heavily felt in the autumn months of 1917 (*A. Y. B.*, 1917, p. 713). Thereafter came a gradual recovery, which, however, received a temporary check during the Spanish-influenza epidemic in October and November, when for two or, in some instances, three weeks nearly every large city throughout the country, except New York, compelled all places of public amusement to close. If the business of the American theatre in the year under consideration did not attain the prosperity that it enjoyed in 1916, it was, nevertheless, considerably more satisfactory than in the year 1917.

For this continued liberal patronage of the productions of the stage during a period when the cost of living was excessively high there is an explanation. It is axiomatic that the theatre prospers in times of unrest and mental stress. The theatre in Paris was commercially successful during the French Revolution and also in the period of the Franco-Prussian War. Our own theatre felt a stimulating effect from the Spanish-American War. In all great national crises the public has instinctively turned to the drama for relaxation and relief, and this fact is the basis for the official view in all countries participating in the recent war that the theatre and acting are essential professions.

During the last, as also during the three preceding, years, the business of the theatre in New York and, to a lesser degree, throughout the country has been benefited by the complete interruption of travel to Europe. New York has become, more than ever before, the playground of the continent where much quickly acquired wealth has been spent, and the theatres, second to the hotels, have received the benefit of this vast transient population. Relatively other large cities have been similarly affected, with the result that the adverse influence of Liberty Loans, campaigns for war charities, and high taxes has been largely counteracted. However stagnating the war has been to the development and progress of the drama as an art, the theatre commercially has not been seriously disturbed.

The centre of theatrical endeavor in America is New York, where most of the important projects of the stage are originated or where they quickly come if they prove successful. Hence the record of New York's 47 so-called producing theatres furnishes a reliable basis for estimating the accomplishments of the year. In these theatres in 1918 (from December 1, 1917, to December 1, 1918) there were produced in the English language 130 new plays of normal length, musical comedies and spectacles, and 24 new one-act plays. The classic and poetic drama, especially the drama of Shakespeare, again suffered the neglect that has been increasing steadily during the last decade. Of Shakespearean plays four were presented by Robert B. Mantell, four by an independent organization known as the Shakespeare Playhouse, and excerpts from three others were acted by Laurette Taylor at special matinées. None of these efforts were of importance artistically. The general record of the theatre exceeds by four long plays the number of productions of the preceding year, but there were six fewer short plays (*A. Y. B.*, 1917, p. 712). All the short plays were presented between the beginning of the year and the closing of the theatres for the summer, a circumstance to which reference will be made later.

Classification of Plays.—An arbitrary classification of plays becomes more difficult each year, for the reason that dramatic authors in all languages are more and more inclined to disregard the accepted laws of form. English plays especially are now written in such a mixture of moods that their *genre* is often almost impossible to decide. But disentangling the dramas written in a serious mood from comedies created for purposes of humor, and grouping avowed melodramas and farces by themselves, it will be found that the year's new plays resolve themselves into 37 dramas, 31 comedies, 15 melodramas and 13 farces. These, with 34 new musical comedies and spectacles, complete the total of 130 productions as already stated. A comparison with the plays produced in 1917 shows that there has been a slight increase in the number of serious works and a like decrease in the comedies, whereas both the melodramas and farces are a trifle more numerous. But the differences in the figures are not great enough to establish evidence of any important change in the public taste. Generally speaking, the American public continues to look to the theatre for relaxation rather than for intellectual stimulus.

Dramatic and Commercial Standards.—When the record of the theatre in America in 1918 is examined in detail and with reference to the artistic quality of the plays, it is disheartening to observe that the expenditure of so much effort and energy and the investment of so much capital have resulted in the addition of so little of permanence or real worth to the fund of dramatic literature. In this respect the theatrical year under review has not differed radically from its immediate predecessors. There is no theatre in New York at the present time that fosters art for its own sake; plays are produced commercially and in wholesale quantities to appeal to an average public taste and to meet the whims of the passing hour.

Owing to the great transient population in New York, there has developed a mania for theatre building which has resulted in placing the stage on a basis of real-estate speculation. Playwriting is an art, perhaps the most difficult of the arts because it involves them all. It is a highly specialized form of creative literary accomplishment, in which personal aptitude and long experience are the most important factors. But so numerous have become the theatres in New York, and so active the competition for new material to keep their curtains up, that the discriminating selection that once decided the acceptance and production of plays is no longer observed. The result is that manuscripts now receive a hearing which, under the older conditions, would get no further than the waste basket. The ultimate effect of such a system is to reduce the average accomplishment of the New York theatre to a hopelessly low intellectual and artistic level.

This condition—it amounts to a great evil—of the theatre is not restricted to America or to the year that has just passed. It is found in the theatre of England and of France, but in the last to a lesser degree. On the other hand, the remoteness of the theatre in the United States from the field of war has protected it, in a measure, from the blight which has fallen upon all creative effort in the arts abroad. Consequently our native drama at the present time is probably more prolific, healthy and vigorous than its foreign rivals.

Preponderance of Native Plays.—The increasing ability of the American theatre to sustain itself is strikingly illustrated by the plays produced during 1918. Ten years ago productions were about evenly divided between the plays of native and foreign authors. But in the year just ended 69 new plays were products of American authors and only 27 were by foreign dramatists. Of the new musical comedies and spectacles, 32 were the work of native composers and librettists and only two were importations. This unprecedented preponderance of native plays was not due, however, to a new desire on the part of American producers to encourage American authors, but to the unproductivity of the theatre in Europe. Not even such established English dramatists as Sir James Barrie, George Bernard Shaw, Henry Arthur Jones or John Galsworthy contributed a new work to the play list of 1918 in the American theatre.

The Little Theatres.—Another interesting feature of the theatre in New York in 1918 has been the disappearance, after the opening of the new season in August, of the so-called experimental little theatres, together with their programmes of one-act plays performed by semi-amateur companies of youthful and revolutionary enthusiasts. With their going has ended suddenly the vogue of the one-act play. Some critics of the drama, among them a few really experienced observers, have thought that they detected in these independent organizations an influence that might ultimately rescue the drama in America from its shackles of commercialism and create for the theatre a new stagecraft. To the writer it has always been obvious that the little theatres with their one-act plays, which had come to be dignified as a "movement", were only another of the frequently recurring fads of the theatre which enjoy their brief day and then disappear, leaving possibly some element of good behind them. The little theatres and their semi-amateur organizations were founded on a fallacy—on the false assumption that play-writing and acting can be approached lightly, without experience gained only with difficulty and without professional knowledge of the stage's art. They prospered for a time through the public's curiosity and were encouraged by much indiscriminate praise. Meanwhile they were generally productive of plays and performances that would not be tolerated anywhere except under the unique conditions that they created. Almost overnight they collapsed. In 1917 there were in New York five or six such little-theatre companies, which presented 30 one-act plays in 10 groups or entertainments (*A. Y. B.*, 1917, p. 715). In 1918 there were 24 one-act plays in seven groups, all presented prior to June 1. Since this date the little theatre companies in New York have disbanded, although a few continue to exist in other cities, and no one-act plays have been publicly performed. At the present writing, however, the Provincetown Players (*A. Y. B.*, 1917, p. 715) are renewing their activities in a transformed private house. It should be noted in this connection that the Neighborhood Theatre does not belong in the category of little theatres. It is a social-settlement institution devoted to other aims.

Notable Productions.—If the commercial management to which all the theatres in New York, and practically throughout the United States, are now committed is not productive of the highest manifestations of dramatic art, it does not result in a dull stage. Plays chosen with the intent of appealing to the widest range of popular interest are not likely to be artistically fine, but they are also not likely to be of a soporific kind. The amount of trash which reaches the stage each year, due to ill-advised and misdirected experiments, is appalling. But good plays are not altogether absent from the boards.

Significantly the finest accomplishment in the theatre's art during 1918 was not a project of commercial management. Margaret Anglin undertook, with the aid of the New York Symphony Orchestra, the production of two Greek tragedies, "Electra" and "Medea", at Carnegie Hall, and demonstrated by her own performance of their tragic heroines and by the relative excellence of the company with which she surrounded herself that acting as a fine art is by no means dead. By her intensity of tragic passion, purity of elocution, and authority of presence and manner she completely reincarnated these heroines of classic dramatic literature and fairly earned the applause of packed audiences.

The most notable drama by an American author was "The Copperhead", by Augustus Thomas, and the performance of its hero character of *Milt Shanks* by Lionel Barrymore was the year's best individual accomplishment by an American actor. This Civil War drama, typical of America's spirit of sacrifice for high ideals in the European War, was variable in texture and slightly uneven in interest. But it was a drama of exceptional beauty and strength and led to a final act of remarkable emotional power in which was the most perfect visualization of the spirit of Abraham Lincoln that any author has yet given to the American stage.

Two dramas by foreign authors, differing widely in design and purpose, attained a high standard of artistic excellence, in both production and interpretation. One was Count Leo Tolstoi's "The Living Corpse", under the title of "Redemption", produced by Arthur Hopkins before simplified scenery and draperies designed by Robert Edward Jones. Episodical and defective technically as a play, it nevertheless contained minute analyses of character and motives and moments of intense dramatic power, and its leading character of *Fedya*, the aristocrat who gradually sinks to the dregs of vice and squalor through his inherent weakness, was interpreted graphically and with power by John Barrymore. The other play was "The Betrothal" by the Belgian poet, Maurice Maeterlinck. Written as a sequel to "The Blue Bird", it was a fantasy of rare imagination, poetic fervor and philosophical significance, spectacularly staged in scenes of exquisite delicacy and loveliness by Winthrop Ames.

Of outstanding excellence, each in its own way, were three other plays of lighter texture and interest. "Why Marry?" by Jessie Lynch Williams, a comedy satirical of conventional marriage, was in a conversational style, betraying close acquaintance with the plays of George Bernard Shaw. It afforded intellectual entertainment of a fairly high order and was written with literary proficiency. In "Be Calm, Camilla", Clare Kummer contributed another to her series of sparkling, fanciful and indefatigably witty comedies, expert and well finished, but with only a pretense of substance in story or plot. Finally there was "Sleeping Partners", adapted into English from a French farce by Sacha Guitry, typical of the spirit of the Paris boulevards, but novel and ingenious in its clever handling of the traditional triangular relationship of characters. The piece proved to be exceedingly amusing and relatively harmless.

Behind these conspicuous plays, and at a respectful distance, come about 15 others, which may be grouped as the "popular successes" of 1918. Four were importations from the London stage. The remaining 11, in their aggregate, were typical of the roughly written but photographically accurate dramas and comedies which are characteristic of the general work of native American dramatists at the present time—plays which make no pretense of literary quality or artistic finish, but which appeal intimately to the popular taste and afford good ephemeral entertainment. Of the native examples may be recorded "Lightnin' ", a comedy-drama by Winchell Smith and Frank Bacon, in which the latter impersonated a lovable, homely character suggestive of the *Rip Van Winkle* of Joseph Jefferson; "The Gypsy Trail", a comedy pulsating with youthful ideals and enthusiasm, by Robert Housum; "Seventeen", a particularly successful and humorously faithful study of the vagaries of adolescent youth, based by Stanislaus Stange and Stannard Mears on the inimitable published stories by Booth Tarkington; "Tea For Three", a sparkling comedy by Roi Cooper Megrue, after the style of the Viennese school of playwrights; "Three Faces East", an effective but mystifying spy melodrama, by Anthony Paul Kelly; "Happiness", a domestic comedy by J. Hartley Manners, which, however, exerted its appeal chiefly through Laurette Taylor's sympathetic acting in the title *rôle;* "Friendly Enemies", a comedy with a war interest containing two interesting character sketches, by Samuel Shipman; "The Big Chance", by Grant Morris and Willard Mack, showing roughly but interestingly, and dramatically effectively, the spiritual influence of the war upon the moral bankrupt, and "Daddies", by John L. Hobble, a sentimental comedy dealing with little victims of the war, produced exquisitely by David Belasco.

The foreign plays which fell within this category include "Under Orders", an English war drama by Berte Thomas, employing only two actors in its four characters, which stands as the year's example of unique and adroit technique; "The Saving Grace", written with literary fluency by C. Haddon Chambers and reintroducing Cyril Maude, the London comedian, in a congenial comedy *rôle;* "Her Country", by Rudolph Besier and Sybil Spottiswoode, effective as a satirical study of Teutonic traits of character and fairly interesting as a drama, and "The Better 'Ole", a nondescript but genuinely human and humorous series of character sketches, with musical accompaniment, based on the lighter phases of trench life in Flanders, which was inspired by the war cartoons drawn by Capt. Bruce Bairnsfather of the British Army.

An interesting series of Ibsen plays dominated by Alla Nazimova resulted in the first New York production of "The Wild Duck" and revivals of "Hedda Gabler" and "A Doll's House", at the Plymouth Theatre. The first and third of these were highly competent; the second was inexplicable, owing to the star's misinterpretation of the *rôle* of *Hedda.*

The direct effect of the war upon the entertainments of the American theatre is shown by the fact that 25 of the 96 new plays acted in 1918, or nearly 25 per cent., were on war themes. None of these plays—they were principally melodramas — equalled, in spiritual exaltation or in the human note which they sounded, "Out There", by J. Hartley Manners, or the short plays, "The New Word" and "The Old Woman Shows Her Medals", by Sir James Barrie, written two years earlier, although "Under Orders", by Berte Thomas, was the year's most interesting example of novel dramatic construction.

With the exception of Cyril Maude, the English comedian, no foreign celebrity of note paid a professional visit to the theatres of the United States during 1918. No new native actor of promise came into view. The art of acting at the present time is keyed to the demand for naturalism in the commercial theatre. Acting is, in general, photographically true, but it is seldom highly imaginative or inspirational. Especially in the matter of pure elocution our players are deficient. It will need a revival of interest in the romantic and classic drama to bring the histrionic art back to its former estate.

XXIX. LITERATURE AND LANGUAGE

AMERICAN LITERATURE

(*Nov.* 15, 1917, *to Nov.* 15, 1918)

EDWARD EVERETT HALE

Book Production.—The war has passed away almost as suddenly as it came, but we cannot yet state, except in the most superficial way, what has been its effect on literature in general and in our country. So far as quantity is concerned, its effect is not yet noticeable in the returns for book production. The total number of books (including pamphlets) published in the United States in recent years has been as follows:

1914	8,563
1915	6,932
1916	8,430
1917	8,820
1918	9,550

The figures for 1918 are estimated on the returns of the first 10 months, but they are probably not far from correct.

War Books.—Of this great number of books produced very many are directly inspired by the war. Not many of them, it may be surmised, will make a figure in future histories of American literature, and many of them belong obviously to history or economics. One could not possibly give here a list of the books, or even kinds of books, belonging to literature that should be noted. But it can be said that few fields of interest are unrepresented. All sorts of people have written—from President Wilson to Private Peat, and from Dorothy Canfield Fisher to the author of *Dere Mable*—and they have written every sort of thing about the war that one can imagine. Our great public men and our historians and diplomatists have written and our soldiers and sailors and nurses have written as well. Our best novelists have turned their experience into fiction, and the most average purveyors of popular reading have seized on the war as a drawing motive.

Some notion of the range of the war-literature may be given by the following summary or selection. President Wilson's messages and addresses have been collected in *In the First Year of the War* (Harpers). Theodore Roosevelt published his manifestos in *The Great Adventure* (Scribners). *Secretary Baker at the Front* by Ralph A. Hayes (Century) and *Frontiers of Freedom* (Doran), a collection of speeches made by Secretary Baker, give some first-hand ideas from high sources. Henry Morgenthau in *Ambassador Morgenthau's Story* (Doubleday, Page) gives his experiences in Constantinople in a book which has not only historical material of the first value, but also a continuously interesting series of impressions and observations. Ambassador Gerard continues his record in *Face to Face with Kaiserism* (Doran). The history of our relation to the war is presented by John B. McMaster in *The United States in the World War* (Appleton), a book devoted almost entirely to the impressions of the war rendered by the newspapers and other organs of public opinion. More particular books are Gen. Francis V. Greene's *Our First Year of the Great War* (Putnams), Frederick Palmer's *America in France* (Dodd, Mead) and Frank H. Simonds' *History of the World War* (Doubleday, Page). Meredith Nicholson in *The Valley of Democracy* (Scribner) gives a picture of the people and activities of the Middle West permeated with war conditions. On the other hand, there are all sorts of books written about more particular matters. Heywood Broun in *The A.*

E. F., with General Pershing and the American Forces (Appleton), gives a general view of our affairs abroad. W. S. McNutt's *The Yanks are Coming* (Page) reports for the trenches: E. M. Roberts in *A Flying Fighter* (Harper), among others reports for the air; H. D. Trounce in *Fighting the Boche Underground* (Scribner) gives an account of mines, galleries, underground fights, and other such things; Francis A. Collins writes of *The Fighting Engineers* (Century); Malcolm C. Grow in *Surgeon Grow* (Stokes) writes of two years of doctor's work in Russia; Maud Mortimer in *A Green Tent in Flanders* (Doubleday, Page) writes of nursing in Belgium; Isabel Anderson in *Zigzaggings* writes of life in a canteen on the Marne; Burton E. Stevenson in *The A. L. A. in Europe* gives an account of library work with the army; F. A. McMullen and Jack Evans in *Out of the Jaws of Hunland* (Putnams) tell of the adventure of the prisoner. There are many accounts of naval life. Reginald W. Kauffman in *Our Navy at Work* (Bobbs, Merrill), Albert N. Depew in *Gunner Depew* (Reilly & Britton), and J. B. Connolly in *The U-boat Hunters* (Scribners) give various aspects. Besides these books on the more usual manifestations of war and battle are others less obvious. Coningsby Dawson in *The Glory of the Trenches* (Lane) gives a view of the spiritual side of war, while William J. Dawson in *The Father of a Soldier* (Lane) gives the complementary picture. There are not a few books of poems, to be noted elsewhere, and humorous books like *Dere Mable* by Edward Streeter (Stokes).

There are hundreds of other books that may have as much reason to be mentioned as those above noted (who can read them all?), but such a list is enough to give an idea of the general effect of the war on literature. It aroused and stimulated an immense amount of writing upon a deeply moving subject. People were able to write, or at least gained an audience for their writing, who would otherwise have remained unheard, and experiences of body and soul were recorded that might otherwise never have come to expression. Yet all this is in the main more journalism than literature, more the material of literature than literature itself. Sometimes one reads a book like Dorothy Canfield Fisher's *Home Fires in France* (Holt) of which one feels, "This must certainly be something that will last," but even here the critic must confine his emotional sympathy if he wish to render a true account. Probably those are right who say that this war, like other wars, will not have much direct effect on literature, but will affect literature later through the greater fullness and richness of emotion and sympathy that have come into the lives of men and women. Thus Robert Herrick, writing in the *Dial* for Jan. 3, 1918, thinks that the true effect of the war will be when it has "passed into our hearts and souls, having got to be a part of our national consciousness". Something of the sort would seem to be more in accord with the history of literature. Art in the past has generally done more with a rich and general tradition than with immediate and violent stimulants.

Fiction.—When we turn from the very exciting fact to the field of fiction, we find not unnaturally that not only is the fiction more or less colored with war fact, but that there is not so much of it. That is natural; in the presence of such immense happenings as those of the past year one's own little imaginings seem trivial. We are tempted to say, "What are *our* woes and sufferance?" in comparison with all that we daily read and see. As a result, not a few of those who have written fiction recently have either been busy with war work and thus have not written at all, or have been content to report actual fact instead of imagining things less moving. In the lists of "war books", such as those just given, one notices the names of not a few who have been known previously as writers of fiction. Out of a small list like the above there are Mrs. Fisher, Coningsby Dawson, James B. Connolly, Burton E. Stevenson and Reginald Kauffman whose books at other times would be found among the novels of the year. Some of our novelists have taken subjects immediately suggested by the war. Mrs. Wharton has written a beautiful story called *The Marne* (Appleton) to express the feelings that have grown with her work abroad. Other well known novelists have seen in the events and figures of the war something that has stirred them to creation. Such are Mrs. Atherton's *The White Morning* (Stokes), Tilden Freeman's *Khaki* (Macmillan), Mary E. Waller's *Out of the Silences* (Little, Brown), Samuel H. Adams's *Common Cause* (Houghton, Mifflin). Ralph D. Paine's *The Call of the Offshore Wind* (Houghton, Mifflin), R. W. Chambers' *The Laughing Girl* (Appleton), Olive Galbreath's *Miss Amerikanka* (Harper), Rupert Hughes' *The Unpardonable Sin* (Harper), and W. J. Dawson's *The War Eagle* (Lane). Few of these books, however, are direct pictures of the war, such as some that have been written in England or France. We may remember that the greatest war-novels—like Tolstoi's *War and Peace* and Sienkiewicz's *With Fire and Sword*—have been written long after the times they have celebrated.

It would seem, however, that the absolute amount of fiction was less than usual. If we look at the figures again, we find that the number of books classified in the publisher's reports as fiction by American authors was as follows:

1914	689
1915	643
1916	703
1917	707
1918 (estimated)	581

The forms of fiction are much what we have seen for several years, although there is a greater proportion than usual of stories of wild life and adventure, caused perhaps by a restless feeling that fiction ought to be as exciting as the current excitements of fact. Whether this be the reason or not, there is an unusual number of open-air stories of the West or North. One can give something of a guess at them from the authors and titles: Rex Beach, *The Winds of Chance* (Harpers); Zane Grey, *The U. P. Trail* (Harpers); H. H. Knibbs, *The Tang of Life* (Houghton, Mifflin); Peter B. Kyne, *The Valley of the Giants* (Doubleday, Page); Ridgewell Cullom, *The Triumph of John Kars* (Jacobs); B. M. Bowers, *Sky-rider* (Little, Brown); C. A. Seltzer, *"Firebrand" Trevison* (McClurg); Harold Bindloss, *The Lure of the North* (Stokes); Marah E. Ryan, *The Treasure Trail* (McClurg); Robert C. Stead, *The Cow-Puncher* (Harpers); G. G. Van Schaick, *The Peace of Roaring River* (Small). There are fewer stories of the sea: C. T. Brady, *Waif o' the Sea* (McClurg); Randall Parrish, *Wolves of the Sea* (McClurg); and R. E. Smith, *Sea King of Barnegat* (Duffield). Stewart Edward White in *Simba* (Doubleday, Page) returns to Africa, while E. R. Burroughs in *The God of Mars* (McClurg) has got quite off the earth. There are a few good detective stories, N. S. Lincoln's *The Three Strings* (Appleton), F. N. Greene's *The Devil to Pay* (Scribners), and John T. McIntyre's *Ashton Kirke, Criminologist* (Penn) being the most interesting. There are a few good historical novels, of which E. L. White's *The Unwilling Vestal* (Dutton), an excellent and original book, is the best.

The other kind of novel, however, the novel of everyday life and character, is still in the majority as usual in spite of war books and books of adventure. We can give here but a bare suggestion; the directions of interest are not very different from former years. We mention then: Zoe Beckley, *A Chance to Live* (Macmillan); Josephine Daskam Bacon, *On Our Hill* (Scribners); G. W. Cable, *Flower of the Chapdelaines* (Scribners); W. S. Cather, *My Antonia* (Houghton, Mifflin); Croy Homer, *Boone Stop* (Harper); Maria T. Daviess, *The Golden Bird* (Century); Henry B. F. Fuller, *On the Stairs* (Houghton, Mifflin); Zona Gale, *Birth* (Macmillan); H. Hagerdorn, *Barbara Picks a Husband* (Macmillan); Joseph Hergesheimer, *Java Head* (Knopf); Emerson Hough, *The Way Out* (Appleton); J. C. Lincoln, *Shavings* (Appleton); Helen R. Martin, *Maggie of Virginsburg* (Century); Samuel Merwin, *Henry is Twenty* (Bobbs, Merrill); Alice Duer Miller, *The Happiest Time in Their Lives* (Century); Charles G. Norris, *Salt* (Dutton); Kate Norris, *Josse-*

lin's Wife (Doubleday, Page); Ernest Poole, *His Second Wife* (Macmillan); Gene Stratton Porter, *A Daughter of the Land* (Doubleday, Page); S. Strunsky, *Professor Latimer's Progress* (Holt); Booth Tarkington, *The Magnificent Ambersons* (Doubleday, Page); Elias Tobenkin, *The House of Conrad* (Stokes); Mrs. Mary A. Watts, *The Boardman Family* (Macmillan); Henry K. Webster, *An American Family* (Bobbs, Merrill); W. A. White, *In the Heart of a Fool* (Macmillan). Here are two dozen books of which we should like to say a word, but we must be content with the mere record.

Short Stories.—It is perhaps foolish to try to say anything about short stories in a short review like this; there are so many and of so many kinds. E. J. H. O'Brien gives the account of a special student, though too late for us to use. His *Best Stories of 1917 and Yearbook of the American Short Story* (Small) is a necessary authority. He gives not only the best stories that have been published, but also a great deal of biographical and bibliographical material. It is of interest to note that his selection of the best stories includes none of those mentioned in last year's YEAR BOOK. Without Mr. O'Brien's wider range and deeper view, we will mention as worth while a few collections that have got themselves together out of the whole enormous number that are produced. We note Joseph Hergesheimer's *Gold and Iron* (Knopf), three novelettes rather than short stories, which give one a much firmer and more serious impression than most such collections. Daniel Wilber Steele's *Land's End* (Harpers) is introduced by Mr. O'Brien, who gives the writer a position far beyond the reach of most story writers. Among the well known writers Alice Brown publishes her recent work in *The Flying Teuton and Other Stories* (Macmillan); Alice Hegan Rice, *Miss Mink's Soldier* (Century); Fanny Hurst, *Gaslight Sonatas* (Harpers); Edna Ferber, *Cheerful, by Request* (Doubleday, Page). Leo Robbins is a new writer (to us at least); his *Mary the Merry and Other Stories* (Stratford) shows much clever talent. Ellis Parker Butler in *Philo Gubb* (Houghton, Mifflin) has achieved a wonder, a really new kind of detective story, not only humorous, as would be expected, but humorous in a wholly unexpected way. There are a good many war stories, of which A. G. Empey's *Tales from a Dug-Out* (Century) is at least characteristic.

Poetry.—Of course poetry is immensely interesting nowadays. Prof. W. L. Phelps in his *Advance of English Poetry in the Twentieth Century* (Dodd, Mead) says that there never was "a time when there were so many poets in activity, when so many books of poetry were not only read but bought and sold, when poets were held in such high esteem, when so much was written and published about poetry, when the mere forms of verse were the theme of such hot debate". An oldster of an earlier generation may easily agree with him, in thinking of his own youth; in the '80s there was a general notion that deep feeling in poetry had had its day, a great day in truth, but one which had come to an end and had left the clever young men of the end of the century to the charming amusement of French forms and Eighteenth Century octosyllabics, and not too many of them. Nowadays there are certainly more poets and there is certainly more interest in poetry. In the last few years we have seen a very great range from the *Horse Sense* of Walt Mason to the *Irradiations* of J. S. Fletcher. By this time free verse is so general that one need say nothing to explain. Amy Lowell has written *Can Grande's Castle* (Macmillan) in polyphonic prose. The word "prose" refers merely to the way her poetry is printed, namely, in a block like this page; the word "polyphonic" (many-voiced) indicates her rhythmic movement, which is her poetic form. However one may feel about her conceptions of poetic form (some of which she explains in her preface), one will probably feel that in substance, in poetic feeling and fire, she has done something in these lyric narratives that she never did before. Edgar Lee Masters in his *Toward the Gulf* (Macmillan) continues, as he says, the attempts of *The Spoon River Anthology* and *The*

Great Valley to mirror the age and the country in which we live. As in his first volume, his interest here is chiefly in life as it is indicated in those that are gone, but his form is more varied than in the *Anthology* and his field broader. Carl Sandburg's *Cornhuskers* (Holt) and Sherwood Anderson's *Mid-American Chants* (Lane) give more than a hint of their kind by their very names. Mr. Sandburg is more of a poet; Mr. Anderson's great talent shows to better advantage in some of his prose. It is not easy to pick out the best of a great number of books of interest though of lesser value. There is not a little "war verse" that should be recorded; we mention K. G. Duffield's *Bill of the U. S. A.* (Duffield), Berton Braley's *In Camp and Trench* (Doran), E. A. Guest's *Ovcr Here* (Reilly & Britton), C. Divine's *City Ways and Company Streets* (Moffatt), and Mary C. Davies' *The Drums in Our Street* (Macmillan). There are a number of collections, for example, H. A. Gibbons's *Songs from the Trenches* (Harper), C. E. Andrews' *From the Front*, and Frank Foxcroft's *War Verse* (Crowell). One will not inquire too curiously as to the purely poetic character of these verses; they were deeply felt, and they should be deeply felt. For the moment one will not think it wise to try to form estimates. There are one or two books on poetry which are valuable. C. E. Andrews' *The Writing and Reading of Verse* (Appleton) is a very successful attempt at a popular and also sound treatise on meter. W. L. Phelps's *The Advance of English Poetry*, from which we quoted above, is an account marked by much appreciation joined to a great deal of useful information.

Essays and Criticism.—Among the books of essays and criticism may be noted first Joseph W. Beach's *The Method of Henry James* (Yale University), a thorough and careful study of the work of a great American man of letters Those who have been rather dissatisfied with the many vague appreciations and smart generalizations concerning James will be glad to see this study of a different character. Mr. Beach has the method of a scholar, and instead of being content with reading and enjoying and talking, he wants really to know something about his subject. His book is, therefore, the one and only book beside James' own that the student of James cannot afford to miss. One cannot say quite as much of R. C. Holliday's study of *Booth Tarkington* (Doubleday, Page). Neither subject nor study is so noteworthy as the preceding, but it is an excellent thing to make a study of the striking figures of our literature. Another definite piece of work of American criticism is Bernard Berenson's *Essays in the Study of Sienese Painting* (F. F. Sherman). More "modern" than either of the above are Francis Hackett's *Horizons: a Book of Criticism* (Heubsch) and Van Wyck Brooks' *Letters and Leadership* (Huebsch). These collections are by men who are generally thought of in connection with the *New Republic*, a periodical which has lately come to stand for a modern comment on current events in the light of much cleverness and information. It may be remarked here that the *Dial* has removed to New York, and definitely extended its field to include social and political problems as well as the view of literature which formerly satisfied it. The *Dial* is not quite so modern as the *New Republic* and not quite so smart; its editors are older and rather more academic. Beside these books of criticism there are a number of collections of essays of, as we may say, the old sort. C. D. Morley's *Shandygaff* (Doubleday, Page) is a good example, a book made up of essays, stories and sketches, on all sorts of literary and non-literary subjects. The title conveys a sense of the traditional past; it would seem not to be currently understood in the bars and clubs of today. R. C. Holliday's *Walking-stick Papers* (Doran) is another delightful collection of a very cheerful and clever kind. Elizabeth Woodbridge in *Days Out and Other Papers* (Houghton, Mifflin) has a fresh and unhackneyed collection. Three such are more than one usually gets in one year.

Biography.—There is not so much biography this year as heretofore. The most noteworthy thing among the memoirs is *The Education of Henry*

Adams, an autobiography with an Introduction by Henry Cabot Lodge (Houghton, Mifflin). Any account of this distinguished member of this distinguished family would, on the face of it, be of interest. But Henry Adams was not only an Adams but a man of especial gifts and abilities, and his memoirs are therefore full of character. A more definite study is F. E. Leupp's *George Westinghouse* (Little, Brown). This study of the life of a representative American who came to note in a particularly American way is a useful and necessary addition to our means of estimating the powers and duties of our country. Mrs. J. C. Harris's *Life of Joel Chandler Harris* (Houghton, Mifflin) is a delightful account of a very delightful figure in American literature. The *Letters of Anne Gilchrist and Walt Whitman* (Doubleday, Page) are an interesting contribution to our means of knowing more accurately one who is more and more emerging into the position of the great representative poet of America. Arthur N. Davis's *The Kaiser as I Knew Him* (Harpers) will probably not belong to literature, but may be at least remarked. A book of more formal biography is Edward W. Miller's life of Wessel Gansfort in the edition of Gansfort's *Works* published by Putnam. Gansfort was one of the "reformers before the Reformation", and although there is not enough historical material to give a very full idea of his personality and its development, Professor Miller is able to group around him the elements of a great historical period in a very interesting way.

Necrology.—There have died during the year Hubert Howe Bancroft (March 3), the historian of the Pacific Slope; Henry Adams (March 27), the historian mentioned above; John A. Mitchell (June 29), most widely known as one of the founders and editors of *Life;* and Joyce Kilmer, one of the younger poets and critics, killed in battle on Aug. 1.

MODERN LANGUAGES AND LITERATURE

ENGLISH LANGUAGE AND LITERATURE

ALBERT C. BAUGH

English Philology.—In H. Hilmer's "The Origin and Growth of Language" (*JEGP*[1]) an attempt is made to explain language on the basis of concepts, though the results differ from Wundt's. John T. Clark, in *Lexicographical Evolution and Conceptual Progress* (California), considers the testimony which vocabulary affords concerning certain aspects of a people's mentality. C. M. Lotspeich, in "Accent-Mixture and Sound Changes" (*JEGP*), explains consonant shifts and umlaut on the basis of two different types of accent, the Nordic and the Alpine. S. S. Ripins presents "Notes on Old English Lexicography" (*MLN*), and K. Malone attempts an explanation of "The *A* of *Father, Rather*" (*MP*). M. Callaway, Jr., has published *Studies in the Syntax of the Lindisfarne Gospels* (Hopkins). R. Taylor offers "Some Notes on the Use of *can* and *couth* as Preterite Auxiliaries in Early and Middle Scottish Poetry" (*JEGP*) before being replaced by *did* about 1500. S. Moore notes "Robert Mannyng's Use of *do* as Auxiliary" (*MLN*) a century earlier than Lydgate, who is the first to use it extensively. R. O. Stidston examines *The Use of "Ye" in the Function of "Thou" in Middle English Literature from MS. Auchinleck to MS. Vernon* (Leland Stanford), J. F. Royster considers "The Causative Use of Hatan" in Old English (*JEGP*), and J. Zeitlin treats "The English Verbal as Adverb" (*Neophilologus*). Rhythmical and metrical studies include Miss A. L. F. Snell's *Pause: A Study of its Nature and its Rhythmical Function in Verse* (Michigan), her "Syllabic Quantity in English Verse" (*PMLA*), and F.

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[1] Periodicals are cited under the following abbreviations: *MLN, Modern Language Notes; MLR, Modern Language Review; MP, Modern Philology; PMLA, Publications of the Modern Language Association of America; JEGP, Journal of English and Germanic Philology; SP, University of North Carolina Studies in Philology; RR, Romanic Review.* Titles appearing as theses or in the publications of universities are followed where possible by the name of the university.

N. Scott's "The Accentual Structure of Isolable English Phrases" (*ibid.*).

Old English Literature (449-1150).—Except for F. G. Hubbard's textual note on "Beowulf 1598, 1996, 2026; Uses of the Impersonal Verb *geweorthan*" (*JEGP*), the only article on Old-English literature is Fr. Klaeber's "Concerning the Relation between *Exodus* and *Beowulf*" (*MLN*), in which the evidence for the priority of the *Exodus* is presented.

Middle English Literature (1150-1250).—In Middle-English literature J. E. Wells has issued a *Supplement* to his *Manual* mentioned two years ago (*A. Y. B.*, 1916, p. 755). Miss C. D'Evelyn has written of "The Middle-English Version of the *Revelation* of Methodius; with . . . the Influence of Methodius in Middle-English Writings" (*PMLA*); Miss Hope Emily Allen presents a lengthy preliminary statement of "The Origin of the *Ancren Riwle*" (*PMLA*), connecting it with Kilburn Priory. Miss Allen has also traced the source of "The Mystical Lyrics of the *Manuel des Pechiez*" (*RR*) and discussed "The *Manuel des Pechiez* and the Scholastic Prologue" (*RR*), casting doubt on William of Waddington's authorship of the Anglo-Norman version. W. H. Hulme has edited *Richard Rolle of Hampole's Mending of Life* from the fifteenth century Worcester Cathedral MS. F. 172 (Western Reserve Univ. Bull.). R. M. Garrett has published *The Pearl: An Interpretation* (University of Washington), and A. J. Perry has printed "Notes on John Trevisa" (*MLN*), showing among other things that Trevisa was dead in 1402.

The fine interest of American scholarship in Chaucer continues unabated. Samuel Moore, in "New Life-Records of Chaucer" (*MP*), prints abstracts of two documents (of 1374 and 1377) touching upon some difficult questions of Chaucer's connection with the controllership of petty customs. Miss M. H. Shackford has reëdited a useful brief Chaucer bibliography (Wellesley). J. L. Lowes, in carrying out his recently proposed intention of demonstrating that Chaucer made use of French translations and adaptations of classical material, shows in "Chaucer and the *Ovide moralisé*" (*PMLA*) that Chaucer knew and used at least part of that work. In line with the same attempt is his "Chaucer's *Boethius* and Jean de Meun" (*RR*). In "The *Franklin's Tale*, the *Teseide*, and the *Filocolo*" (*MP*), Lowes points out a noteworthy borrowing in the *Franklin's Tale* from the *Teseide* and discusses exhaustively the counter claims of Schofield and Rajna regarding the *Filocolo* as Chaucer's source in this tale. W. E. Farnham's "Chaucer's *Clerkes Tale*" (*MLN*) gathers together a number of passages in which Chaucer is closer to Boccaccio's Italian than to Petrarch's Latin, the usually accepted source. F. Tupper discusses "The Envy Theme in Prologues and Epilogues" (*JEGP*) in English literature generally, but with special reference to Middle English and Chaucer. T. A. Jenkins exhaustively comments upon "Deschamps' Ballade to Chaucer" (*MLN*), and is commented upon by G. H. Gerould in "Deschamps as Eustace" (*MLN*). A. S. Cook discusses at length Giovanni da Lignano in "Chaucer's Linian" (*RR*), one of the three Italian contemporaries of Chaucer whom he mentions by name, and adds what he thinks is a fourth allusion to Homer in "Chaucer's Griselda and Homer's Arete" (*Am. Jour. Philol.*). H. B. Hinckley completes our list with "Chauceriana" (*MP*).

The romance has not been wholly neglected. Miss V. D. Scudder has written a good sized volume on *The Morte D'Arthur of Sir Thomas Malory and Its Sources.* Professor Bruce has published elaborate studies of "Pelles, Pellinor, and Pellean in the Old French Arthurian Romances" (*MP*) and "Galahad, Nascien, and Some Other Names in the Grail Romances" (*MLN*). Wm. A. Nitze, in "The Glastonbury Passages in the *Perlesvaus*" (*SP*), tries once more to establish the connection of the *Perlesvaus* with Glastonbury material. R. B. Pace in "*Sir Perceval* and *The Boyish Exploits of Finn*" (*PMLA*) cites an Irish parallel to the romance. Two Middle-English texts have been printed, "Death and Life: An Alliterative Poem" (*SP*) of the fifteenth century, edited by J. H. Hanford and J. M. Steadman, Jr., and a "Dialogue between a Clerk and a Husbandman" (*MLN*) of the same century, printed by Carleton Brown. H. M. Belden's "Boccaccio, Hans Sachs, and *The Bramble Briar*" (*PMLA*) studies intensively this "traditional vulgar ballad". J. McGil's *Folk-songs of the Kentucky Mountains* and, though not American, Miss Campbell and Cecil J. Sharp's *English Folk-songs from the Southern Appalachians* deserve mention as attempts to collect English material still traditional in this country. G. L. Kittredge has edited some "Ballads and Songs" (*Jour. Am. Folk-Lore*), and H. E. Rollins prints "Notes on the Shirburn Ballads" (*ibid.*). In folk tales and motives T. F. Crane's "Medieval Sermon Books and Stories and Their Study since 1883" (*Jour. Am. Philos. Soc.*) and his "The Mountain of Nida: An Episode of the Alexander Legend" (*RR*) are especially valuable. A. Taylor traces "The Motive of the Vacant Stake in Folklore and Romance" (*RR*) to a Celtic source, P. F. Baum treats "The Three Dreams or Dream-Bread Story" (*Jour. Am. Folk-Lore*), and M. E. Barnicle connects "The Exemplum of the Penitent Usurer" (*PMLA*) with the morality play.

The early drama is always of interest. Hardin Craig, "The Lincoln Cordwainers' Pageant" (*PMLA*), publishes entries in the Lincoln Cordwainers' Company which are incidentally of value as indicating that the Lincoln plays were probably not processional. F. H. Miller points out "Metrical Affinities of the Shrewsbury *Officium Pastorum* and its York Correspondent" (*MLN*); Grace Frank presents evidence that "Revisions in the English Mystery Plays" (*MP*) were often made separately and independently, not in the cycle as a whole; and the present writer has instanced parallels to prove the folk origin of "The Mak Story" (*MP*). Robert Withington, who for some time has been publishing material on the pageant, has issued the first volume of *English Pageantry: An Historical Outline*, and has supplemented it with "The Early 'Royal Entry'" (*PMLA*), showing that the royal entry did not take the form of pageants until 1295, "The Lord Mayor's Show for 1590" (*MLN*), and "A Civic 'Triumph' *circa* 1700" (*JEGP*).

Modern English Period (since 1500).—The recent favor which Spenser has enjoyed in this country continues as great as ever. Chief among the contributions of the year is H. E. Cory's *Edmund Spenser: A Critical Study* (California). C. H. Whitman has compiled *A Subject Index to the Poems of Edmund Spenser*. A. H. Tolman, in "The Relations of Spenser and Harvey to Puritanism" (*MP*), advocates the view that both men were always Low-Churchmen. Edwin Greenlaw writes of "Spenser's Fairy Mythology" (*SP*), W. F. DeMoss in "Spenser's Twelve Moral Virtues 'According to Aristotle'" (*MP*) replies to Jusserand, showing that Spenser did base his twelve moral virtues on Aristotle, and F. M. Padelford, in "Talus: The Law" (*SP*), tries to show that Talus in the *Faerie Queene* is to be interpreted as the law and the agents who enforce it, not as the abstract principle of justice. O. F. Emerson, in "Spenser's Virgil's Gnat" (*JEGP*), makes a comparative examination of Spenser's translation and the pseudo-Virgilian *Culex;* and A. S. Cook notes "Five Spenserian Trifles" (*JEGP*). Notes on other Elizabethans include J. Q. Adams' proof that "Michael Drayton's *To The Virginia Voyage*" (*MLN*) is a metrical version of certain prose passages in Hakluyt, H. E. Rollins' "New Facts about George Turberville" (*MP*), W. P. Mustard's "Notes on Lyly's *Euphues*" (*MLN*), and R. M. Smith's "The Date and Authorship of Hall's Chronicle" (*JEGP*).

Shakespeare and the Founders of Liberty in America is a timely volume by C. M. Gayley, showing that Shakespeare must have known a number of the members of the Virginia Company. Lawrence Mason has added "Some Further Shakespeare Allusions or Parallels" (*MLN*) to the already extensive list, and A. Thaler has tried to demonstrate that "Shakespeare's Income" (*SP*) probably did not exceed half the total of over £700 a year with which he has been credited. H. D. Gray, in *The Original Version of "Love's Labour's Lost" with a conjecture as to "Love's Labour's Won"* (Leland Stanford), attempts to distinguish passage by passage between the play as Shakespeare originally wrote it and the revision that he afterwards made. *Love's Labors Won* is to be found, he thinks, in the main plot of mistaken identity in *Twelfth Night*. F. G. Hubbard, "The *Marcellus* Theory of the First Quarto *Hamlet*" (*MLN*), points to obstacles in the way of Gray's theory that the actor who played the part of Marcellus is responsible for the text of the First Quarto *Hamlet*. Alexander Green in "The Apocryphal *Sir Thomas More* and the Shakespeare Holograph" (*Am. Jour. Philol.*) decides against the theory of Shakespearean collaboration. Finally, M. B. Ruud has done a desirable piece of work in *An Essay toward a History of Shakespeare in Norway*.

Students of the Elizabethan drama are this year under a further debt to J. Q. Adams for gathering together in excellent form *The Dramatic Records of Sir Henry Herbert, Master of the Revels, 1623-1673* (Cornell). W. J. Lawrence treats "The Elizabethan Stage Throne" (*Texas Rev.*). D. Klein, "According to the Decorum of These Daies" (*PMLA*), discusses *Gismund of Salerne* and its revision, *Tancred and Gismund*. Miss G. W. Jones seeks "The Political Significance of the Play of *Albion Knight*" (*JEGP*), and F. G. Hubbard presents "Possible Evidence for the Date of Tamburlaine" (*PMLA*) pointing to 1588. W. D. Briggs attempts to establish June 11, 1572, as "The Birth-date of Ben Jonson" (*MLN*). Miss C. Moore has published the first part of a thesis on *The Dramatic Works of Thomas Nabbes* (Pennsylvania). Massinger and Field's *The Fatal Dowry* has been edited by C. L. Lockert, Jr. (Princeton), and Heywood's *Woman Killed with Kindness* and *Fair Maid of the West* by Katherine Lee Bates with a valuable introduction on Heywood. Heywood is also the subject of R. G. Martin's "A New Specimen of the Revenge Play" (*MP*) and "Notes on Thomas Heywood's *Ages*" (*MLN*).

Milton has provoked some discussion. R. L. Ramsey, "Morality Themes in Milton's Poetry" (*SP*), discusses the medieval elements in Milton and his relation to the plots and characters of the morality play. Jas. H. Hanford asserts that "The Temptation Motive in Milton" (*SP*) is a dominant motive in all his imaginative work. John Erskine in "The Theme of Death in *Paradise Lost*" (*PMLA*) finds an inconsistency between the earlier and later accounts of death in the poem, and E. E. Stoll denies the contention in "Was Paradise Well Lost?" (*ibid.*). Wm. A. Webb writes of "Milton's Views on Education" (*Educ. Rev.*), and E. N. S. Thompson in "Milton's *Of Education*" (*SP*) examines this pamphlet in the light of contemporary educational tendencies. The same author in "A Forerunner of Milton" (*MLN*) cites Henry More's *Psychathanasia* (1642) as championing the Copernican theory, which Milton seems to have accepted.

The seventeenth and eighteenth centuries have always had their devotees. H. T. Perry writes of *The First Duchess of Newcastle and Her Husband as Figures in Literary History* (Harvard). L. D. Wallace, on the evidence of a contemporary letter, sets Dec. 20, 1670-Jan. 9, 1671, as "A New Date for the *Conquest of Granada*" (*MP*), Miss A. E. Gipson has studied *John Home* and his tragedies (Yale), and S. S. Swartley has published a thesis on *The Life and Poetry of John Cutts* (Pennsylvania). The outstanding work of the year in the eighteenth century is Wilbur L. Cross' *The History of Henry Fielding*, the authoritative life of the novelist in three volumes, which scholars have known for years Cross was preparing. Miss H. S. Hughes continues her work in the minor novel in "A Precurser of *Tristram Shandy*" (*JEGP*) and "Translations of the *Vie de Marianne* and Their Relation to Contemporary Fiction" (*MP*). Miss A. I. Hazeltine has written a thesis on *William Shenstone and . . . His Critics* (Wellesley). M. E. Smith considers "The Fable as Poetry in English Criticism" (*MLN*) and offers "A Classification for Fables, Based on the Collection of Marie de France" (*MP*). E. C. Knowlton's "Pastoral in the Eighteenth Century" (*MLN*), R. S. Crane's "Imitation of Spenser and Milton in the Early Eighteenth Century: A New Document" (*SP*), W. H. Durham's "Some

Forerunners of the *Tatler* and the *Spectator*" (*MLN*), showing that Steele's work was a natural development of previous beginnings, and Miss C. Goad's *Horace in the English Literature of the Eighteenth Century* treat various topics in eighteenth-century literature.

Towards the end of the century, when we reach the romantic revival, we have to record F. E. Pierce's *Currents and Eddies in the English Romantic Generation.* Mention may also be made of Wm. Haller's *The Early Life of Robert Southey, 1774-1803* (Columbia), F. B. Snyder's "Notes on Burns and the Popular Ballad" (*JEGP*), and Marjorie L. Barstow's *Wordsworth's Theory of Poetic Diction* (Yale). E. C. Baldwin's "Wordsworth and Hermes Trismegistus" (*PMLA*) and S. F. Gingerich's "Shelley's Doctrine of Necessity *versus* Christianity" (*PMLA*) belong to the same group. B. S. Allen has contributed two papers on Goodwin: "William Goodwin as a Sentimentalist" (*PMLA*) and "The Reaction against William Goodwin" (*MP*).

The nineteenth century has not been so fully discussed. W. Chislett, Jr., has issued a small volume of notes and essays called *The Classical Influence in English Literature in the Nineteenth Century.* W. L. MacDonald, in "Charles Lamb, the Greatest of the Essayists" (*PMLA*), has written an enthusiastic appreciation of Lamb and attempted to define his place in the development of the English essay. Miss Shackford writes of "Swinburne and Delavigne" (*PMLA*). In the novel L. W. Berle contrasts *George Eliot and Thomas Hardy;* J. H. E. Crees devotes attention to *George Meredith: A Study of His Works and Personality;* and J. W. Beach examines *The Method of Henry James.*

We may close this account with a reference to some books on contemporary literature and a few works of a general character. Professor Phelps in *The Advance of English Poetry in the Twentieth Century* republishes essays from the *Bookman* on the poets and poetry of today. In his *The Twentieth Century Theatre* he discusses the contemporary English and American stage. He has also published a little booklet on *Archibald Marshall: A Realistic Novelist.* H. T. and Wilson Follett have gathered together in book form essays on *Some Modern Novelists* from Meredith to Conrad. Wilson Follett has also published *The Modern Novel,* a study of the novel during the last two centuries. S. P. Sherman's *On Contemporary Literature* measures recent writers by the standards of permanent literature. E. A. Boyd issues some Irish literary studies under the title *Appreciations and Depreciations.* W. M. Hart has carefully considered *Kipling the Story Writer* (California), and F. M. K. Foster has compiled a bibliographical survey of *English Translations from the Greek* (Columbia). Finally, George Herbert Palmer has published his Earl lectures of 1917 in a volume called *Formative Types in English Poets.* It includes studies of poets from Chaucer and Spenser to Browning, and forms a notable contribution to American criticism.

GERMANIC LANGUAGES AND LITERATURES

DANIEL B. SHUMWAY

German Literature.—Owing to the war with Germany popular articles on German writers have practically disappeared from the magazines and very few translations have been made. Numerous scientific articles, however, testify to the interest still taken by scholars in German literature and philology. Two attempts have been made to show the difference between the older German writers and the militaristic character of modern Germany, one by W. W. Florer in a volume *German Liberty Authors* (Badger), the other in a well written article by F. Tupper, "Battle of the German Books" (*Nation*, Dec., 1917).

In the field of drama and fiction W. A. Hervey has prepared an admirable *Syllabus and Bibliography of the Works of Lessing, Goethe and Schiller* (Lemcke). The seventh volume of Hauptmann's dramas edited by Lewissohn has appeared. Karl Scholz has published an excellent study of *The Art of Translation, with Special Reference to the Dramas of Hauptmann and Sudermann* as Volume xxxvii of the series *Americana Germanica*. A. Henderson has treated of Schnitzler's dramas in his work on *European Dramatists* (p. 397), and one of Schnitzler's novels, *Bertha Garlan*, has appeared in the Modern Library (Boni & Liveright). H. Stevens has made a study of "Description in the Dramas of Grillparzer" (*Pub. Mod. Lang. Assoc.*, xxxiii).

In the field of lyric poetry Chas. W. Stork has continued his admirable translations, this time of the *Lyrical Poems of Hugo von Hofmannsthal* (Yale University Press). J. F. Lambert has published *Luther's Hymns*, and C. A. Williams an hitherto unknown student song of the 16th century (*Jour. of Eng. and Ger. Philol.*, April, 1918).

In the field of literary criticism articles on Goethe are quite numerous. Of chief importance is Calvin Thomas' excellent *Life of Goethe* (Holt), giving the main facts of his life and a detailed criticism of his works. W. J. Keller has interestingly shown how certain passages of the first part of Faust have served as a source for the second part (*Mod. Lang. Notes*, June, 1918). In an article *"Zu Goethes Faust in England"*, H. W. Nordmeyer has treated of the Scotchman J. G. Lockhart who was the first to attempt the translation of Faust into English and who did much to break down the prejudice against Goethe in England in the early nineteenth century. Ernst Feise has pointed out the "Influence of Lessing's *Emilia Galotti* on Goethe's *Werther*" (*Mod. Philol.*, Oct., 1917); Geo. M. Baker has discussed the "Healing of Orestes in Goethe's *Iphigenia*" (*ibid.*); and W. A. Chamberlain, "Longfellow's Attitude towards Goethe" (*ibid.*, June, 1918). Two works in German treat of Schiller, the one by A. H. Appelmann the difference between Schiller's and Kant's conceptions of ethics (Stechert), and the other by O. E. Burkhard the treatment of the events leading up to the drama in Schiller's expositions (*Behandlung der Vorgeschichte in der Exposition bei Schiller*, University of Chicago Press). Heinrich Keidel discusses the influence of Plato and Hegel on Hebbel (*Jour. of Eng. and Ger. Philol.*, July, 1918) and A. W. Porterfield traces the influence of Auerbach on Nietzsche (*ibid.*, Feb., 1918).

In older literature Julius Goebel attempts anew the mooted question of the "Evolution of the Nibelungensaga", (*ibid.*, Jan., 1918). John L. Campion reprints an unknown *Tristan* fragment (*Mod. Philol.*, June, 1918). E. F. Clark has shown the "Use of Charms and Exorcisms in the Writings of Hans Sachs" (*ibid.*, Oct., 1918). Joseph Gillet has continued his studies of the older drama with an article *"Ueber den Zweck des Schuldramas in Deutschland im 16. und 17. Jh."* (*Jour. of Eng. and Ger. Philol.*, Jan., 1918).

German Philology.—In this field several noteworthy articles have appeared. C. M. Lotspeich has continued his accent studies and has tried to show that the Germanic sound shift and mutation are the result of the mixing of two different types of accent, the Nordic and the Alpine (*ibid.*, April, 1918). E. Prokosch in *"Die Indogermanische Media Aspirata"* (*Mod. Philol.*, Feb. and June, 1918), has tried to show that *bh, dh, gh* were voiceless spirants. H. Collitz has written a further article in support of his views of "Early German Vocalism" (*Mod. Lang. Notes*, June, 1918).

German-American Relations. — In this field George W. Spindler has written an admirable life of the German patriot Karl Follen, who, fleeing from the tyranny of his native land, was instrumental in introducing the study of German into New England (*University of Chicago Press*). A splendid study of the *German Drama in English on the Philadelphia Stage from 1794-1830* by C. F. Bredé forms Volume xxxiv of the *Americana Germanica* series.

German Texts and Teaching.—In this field a new edition of Goethe's *Tasso* has been prepared by L. G. Robertson (Longmans). Karl F. Münzinger has compiled a *Phonetic Reader* for the Walter-Krause series (Scribner). A critical review of other texts and grammars is given by L. M. Schmidt in *Recent Textbooks in Secondary-School German* (*School Review*, Feb., 1918). The question of the teaching of German in the schools has been the subject of much discussion. Articles on the question will be found in *Education* (March 30), *School and Society* (March and June), and *School Review* (June).

Scandinavian. — In the Norwegian field the interest centres as usual around Ibsen, whose powerful drama *Ghosts* has been novelized by A. Drayatt (Jacobs). A volume of his dramas containing the *Master Builder, Pillars of Society* and *Hedda Gabler* has appeared in the Modern Library (Boni & Liveright). A. Henderson has treated Ibsen in his work on *European Dramatists* (p. 73), and B. S. Allen has discussed his fondness for repeatedly using the same *motifs* in "Recurrent Elements of Ibsen's Art" (*Jour. of Eng. and Ger. Philol.*, April, 1918). Nazimova's revival of Ibsen has been made the subject of an article, "Ibsen Once Again", by G. C. Hamilton (*Bookman*, June, 1918). Björnsen's verse romance *Arnljot Gelline* has been well translated by Wm. M. Payne as Volume viii of the *Scandinavian Classics*. Martin B. Ruud has an "Essay toward the History of Shakespeare in Norway" in *Scandinavian Studies and Notes* (iv, 2).

In the Swedish field Strindberg's drama *Miss Julie* has appeared in the Modern Library (Boni & Liveright). His eccentric character has been discussed by Otto Heller in his *Prophets of Dissent* (Knopf). The second part of Selma Lagerlöf's novel *Jerusalem* has been well translated by Velma S. Howard under the title *The Holy City* (Doubleday). Chas. W. Stork has an able article on "Swedish Poetry" in the *American Scandinavian Review* (Nov., 1917, and Oliver A. Lindner one on "Writers of Swedish Life in America" (*ibid.*, May, 1918). Godmunder Kamban's four-act drama *Hadda Padda* has been translated by Sadie L. Peller with a foreword from the pen of the Danish critic George Brandes (Knopf).

In the Danish field Martin Nexö's novel *Pelle the Conqueror* has been translated in two volumes by Jessie Muir and Bernard Miall (Holt).

Dutch is represented by translations of two of Louis Couperus' novels by A. Teixeira de Mattos, *Old People and the Things that Pass* and *Dr. Adriaan* (Dodd, Mead).

ROMANCE LANGUAGES AND LITERATURE

George L. Hamilton

French.—During the last year one interest has been paramount, and to no others more than to those whose studies are in those branches of literature that have furnished the bases of modern civilization to the world. Our debt to France, for instance, is due not only to a few adventurers, ships and millions which came to our aid at the beginning of our national history, but because to France we are indebted for maintaining for centuries models of clearness in thinking and perfection in style. American scholarship is paying back part of the debt in its endeavor to elucidate and interpret isolated fragments of her great literature.

In Old French the principal contributions deal with Arthurian literature. M. E. Ogle has confirmed the only rational thesis of "The Sloth of Erec" (*Rom. Rev.*, ix, 1) by illustrations from classical literature. J. Douglas Bruce has continued his valuable studies on the sources of prose romances in his articles "Pelles, Pellinor, and Pellean in the Old French Arthurian Romances" (*Mod. Philol.*, xvi, 113, 337), "Galahad, Nascien and Some Other Names in the Grail Romances" (*Mod. Lang. Notes*, xxxiii, 129), and "The Composition of the Old French Prose *Lancelot* (*Rom. Rev.*, ix, 241), while W. E. Nitze, writing on the "The Glastonbury Passages in the Perlesvaus" (*Univ. of N. C. Studies in Philol.*, xv, 7), continues to give undue authority to one of the latest romances. W. P. Shepard has written an article, which is anything but conclusive, on "Tedbalt of the *Chançun de Guillelmea* and Hugh III, Count of the Maine" (*Rom. Rev.*, ix. 285). Hope Allen in her "Manuel des Pechiez and the Scholastic Prologue" (*ibid.*, viii, 434) and "The Mystical Lyrics of the Manuel des Pechiez" (*ibid.*, ix, 154), in the course of proving her special theses, has developed striking and sane views on vernacular religious literature in mediæval France and England. The publication of "The Middle English Metrical Version of the Revelations of Methodius" and of an abridged version of the Latin text (*Publ. Mod. Lang. Assoc.*, xxxiii, 135) by Charlotte D'Evelyn will be an aid to students of the French version of the same work. The studies of J. L. Lowes on "Chaucer's Boethius and Jean de Meun" (*Rom. Rev.*, viii, 383) and "Chaucer and the *Ovide moralisé*" (*Publ. Mod. Lang. Assoc.*, xxxiii, 312) and T. A. Jenkins' well commented, critical text of "Deschamps' Ballad to Chaucer" (*Mod. Lang. Notes*, xxxiii, 268) are valuable contributions to the intellectual affinities of the two countries concerned. E. S. Sheldon has approached the same subject from a linguistic point of view in his "Some English and Old French Phrases" (*Univ. of N. C. Studies in Philol.*, xv, 1), R. T. Holbrook has added to our knowledge of his subject in his *Étude sur Pathelin Essai de Bibliographie et d'Interpretation* (Elliott Monographs), and Hélène J. Harvitt continues her studies on "Eustorg de Beaulieu, a Disciple of Marot" (*Rom. Rev.* ix, 319). Incidents found in French versions of widely circulated traditions are studied in T. F. Crane's "The Mountain of Nida: An Episode of the Alexander Legend" (*ibid.*, 129), Archer Taylor's "Motif of the Vacant Stake in Folklore and Romance" (*ibid.*, 21) and "Notes on the Wandering Jew" (*Mod. Lang. Notes*, xxxiii, 394), and H. R. Patch on "Mediaeval Descriptions of the Otherworld" (*Publ. Mod. Lang. Ass.*, xxxiii, 601).

Turning to modern French literature, L. C. Lancaster discusses the source and authenticity of "Four Letters of Racine" (*ibid.*, 30) and "Molière's Borrowings from the *Comedie des Proverbes*" (*ibid.*, 208). B. M. Woodbridge has shown how a historical incident passed into one of the first of modern novels in his note, "Mme. de Montespan and la Princesse de Cleves" (*ibid.*, 79). H. L. Bruce in an article on the "Period of greatest Popularity of Voltaire's Plays on the English Stage" (*ibid.*, 20) throws a side light on a portion of his book *Voltaire on the English Stage* (*Univ. of Cal. Publ. in Mod. Philol.*). R. Havens writes on "The Date of Composition of *Manon Lescaut*" (*Mod. Lang. Notes*, xxxiii, 150), while R. C. Whitford throws together a few notes under the title of "Madame de Staël's Literary Reputation in England" (*Univ. of Ill. Studies in Lang. and Lit.*), and "Madame de Staël's Literary Reputation in America" (*Mod. Lang. Notes*, xxxiii, 476). G. C. Chinard has completed his series of studies on an interesting subject in his *L'Exotisme américain dans l'oeuvre de Chateaubriand.* E. P. Dargan continues his "Studies on Balzac" (*Mod. Phil.*, xvi, 351), a bit of literary critical work which has the merit of its own distinctive style. *The Influence of Italy on the Literary Career of Lamartine* by A. Pirazzini forms a volume of the *Columbia University Studies in Romance Philology and Literature*, while the seamy side of the poet's life, based upon his correspondence, is presented to us by D. H. Carnahan in his article, "The Financial Difficulties of Lamartine" (*Mod. Phil.*, xvi, 143), and a most ambitious *Life of Lamartine* in two volumes has been written by H. R. Whitehouse. In his *Sources of the Religious Element in Flaubert's "Salambô"* (Elliott Monographs), A. Hamilton adds one more to the illuminating stylistic studies on the great realist which have been published as the first three volumes of the same series, the fruitful results of the French method of scholarly work in modern literature introduced at Johns Hopkins University a few years ago. H. David has written an informing article on the literary methods of the friend of Flaubert in his *"Les Poésies chinoises de Bouilhet"* (*Mod. Phil.*, xv, 663). In reading O. H. Moore on "Literary Relationships of Guy de Maupassant" (*ibid.*, 645) and "The Romanticism of Guy de Maupassant" (*Publ. Mod. Lang. Assoc.*, xxxiii, 96) one is quite convinced, that if literature is the criticism of life, the criticism of literature demands some experience in life, especially in treating of the work of artists which is the most intense reflection of a living organism. One of our most honored war-time guests, A. Carnoy, at once instructs and delights in his essay, *"L'imagination flamande dans l'Ecole symbolique française"* (*ibid.*, 204). W. W. Comfort has put in a compact form the results of his studies on "The Priest in Modern French Fiction" (*South Atlantic Quart.*, xvii, 113), and R. F. Bowen has told us of "The Peasant Language in Ferdinand Fabre's *Le Chevier*" (*Mod. Phil.*, xv, 675) a technical subject not suitable for treatment in his informing essay on *The Novels of Ferdinand Fabre.* The continual reciprocal borrowing of one literature from another is illustrated in articles by Martha H. Shackford, "Swinburne and Delavigne" (*Publ. Mod. Lang. Assoc.*, xxxiii, 65), L. F. Mott, "Renan and Matthew Arnold" (*Mod. Lang. Notes*, xxxiii, 65), and F. B. Barton, "Laurence Sterne and Théophile Gautier" (*Mod. Phil.*, xvi, 205).

Italian. — C. E. Whitmore offers some new suggestions in his "Studies in the Text of the Sicilian Poets" (*Rom. Rev.*, ix, 269). C. H. Grandgent maintains his position as the first Dante scholar of America in his course of lectures, published under the title of the *Power of Dante*, while Dorothy L. Simons presents some interesting tables in her "Individual Human *Dramatis Personae* of the *Divina Commedia*" (*Mod. Phil.*, xv, 371). A. S. Cook makes some interesting suggestions in "The First Two Readers of Petrarch's Tale of Griselda" (*ibid.*, xv, 633), and gathers together a good deal of inaccessible material upon Petrarch's great legal contemporary Lignano, in the way of a comment on a phrase of Chaucer (*Rom. Rev.*, viii, 553). W. E. Farnham wishes to show in a note, "Chaucer's Clerke's Tale" (*Mod. Lang. Notes*, xxxiii, 193), that the English poet was verbally indebted to Boccaccio's *Decameron* (X, 10), while H. M. Belden, writing on "Boccaccio, Hans Sachs and The Bramble Briar" (*Publ. Mod. Lang. Assoc.*, xxxiii, 327), in the study of an English popular vulgar ballad, extant in both English and American versions, points out the source of an element of that one of Boccaccio tales (IV, 5) best known to us through Keats' dramatic poem *Isabella or the Pot of Basil* (see also *English Language and Literature, supra*). J. L. Lowes makes his usual surprising and substantial additions to our knowledge of Chaucer's sources and art in his "The Franklin's Tale, The Teseide, and the Filocolo" (*Mod. Phil.*, xv, 689), and there are some interesting items in I. de Perott's "Notes on M. A. Scott's Elizabethan Translations from the Italian" (*Rom. Rev.*, ix, 304) and M. P. Tilley's "Della Casa's Galatei in Seventeenth Century England" (*ibid.*, 309). J. Van Horne has a note entitled "Comment on some Posthumous Poems and Fragments of Leopardi" (*Mod. Lang. Notes*, xxxiii, 154), while A. Livingston tells in a way at once informing and amusing what Italian immigrants have made of a combination of their own and our language, of which we have a sample in the article's title, "*La Merica Sanemagogna*" (*Rom. Rev.*, ix, 206).

Spanish.—H. B. Lang completes his "Notes on the Metre of the Poem of the Cid" (*ibid.*, viii, 401; ix, 48), a title which gives no suggestion of the well documented study on the different factors of a widely distributed *genre.* C. C. Marden's critical text and introduction to the *Libre de Apolonio* (Elliott Monographs) is a fair promise of the excellence of an important work, when completed. R. Schevill's study on *The Dramatic Art of Lope de Vega together with the Dama Boba* (*Univ. of Cal. Publ. in Mod. Philol.*) presents many original views on a much discussed subject and offers a readable text of an unpublished play of the prolific Spanish writer. H. Seris has proved once more the truth of the dictum that there is no such thing as a duplicate of an early printed book in what he writes on "*Una Nueva Variedad de la Edicion principe de Quijoté*" (*Rom. Rev.*, ix, 194). *The Neo-Classic Movement in Spain during the XVIIIth Century* (*Leland Stanford Jr. Univ. Publ.*) is a well informed book by R. E. Pellissier, a notice of whose death in fighting in a righteous cause, not then officially our own, appeared in the 1917 issue of the YEAR BOOK (p. 731). K. W. Parmelee has an interesting note on the Spanish-American word "Gringo" (*Rom. Rev.*, ix, 108), M. Krepinsky one on "anchova" (*ibid.*, 96), while E. H. Tuttle comments on a number of less common words in his "Spanish Notes" (*ibid.*, 227, 317).

ANCIENT LITERATURE AND PHILOLOGY

GREEK LITERATURE

WILLIAM ARTHUR HEIDEL

In spite of the severe conditions of the war the publication of books dealing even with subjects apparently so alien as Greek literature and civilization has not ceased; indeed, the reaction noted last year (*A. Y. B.*, 1917, p. 733), tending to emphasize the value of Greek and to make it a more potent factor in the life of today, has not spent itself. In the *Proceedings of the British Academy* (vii) W. Rhys Roberts treats of "Greek Civilization as a Study for the People"; Professor Henry Browne, S. J., of the University of Dublin, gives us *Our Renaissance: Essays on the Reform and Revival of Classical Studies* (Longmans); and Lane Cooper presents *The Greek Genius and Its Influence: Select Essays and Extracts* (Yale University Press, 1917). J. T. Allen's *The First Year of Greek* (Macmillan) by its freshness of treatment seems well calculated to stimulate the study of the language at the only point where under a competent teacher special stimulus is needed. In this connection mention may be made of E. H. Sturtevant's *Linguistic Change: An Introduction to the Historical Study of Language* (University of Chicago Press, 1917) because, though dealing with language study in general, it is by its sound pedagogical sense well suited to aid the student and teacher of Greek.

R. C. Flickinger's *The Greek Theater and Its Drama* (University of Chicago Press, 1918) is an ambitious work on a large subject, touching on many problems and making many minor contributions to the study of the drama, but it leaves much to be desired both in form and content. James Loeb, who has made the cause of classical studies his own and has, by the publication of the Loeb Classical Library and by the previous translation of Croiset's *Aristophanes and the Political Parties at Athens* and *Decharme's Euripides and the Spirit of his Dramas*, enriched the English literature of the Greek drama, now adds to his former benefits by translating, with considerable omissions and adaptations, Professor Legrand's *Daos* under the new and appropriate title, *The New Greek Comedy* (Putnam, 1917), to which the late John Williams White contributed a brief but valuable introduction. Uncertain transport has delayed notice in this place of two books of outstanding merit, the new editions of *The Wasps of Aristophanes* and *The Clouds of Aristophanes* by Benjamin B. Rogers (Bell, 1915, 1916). Long the incomparable standard, Rogers' translations of the plays have been improved in the new edition.

In the Loeb Classical Library two volumes call for notice: E. Cary's *Dio's Roman History* reaches the sixth volume, Professor Perrin's *Plutarch's Lives* the fifth. The excellence of these translations has been commended in former years, and the standard then set is fully maintained.

Paul Elmer More in his *Platonism* (Princeton University Press, 1917) publishes enlarged and extended lectures delivered on the Vanuxem Foundation. While the book will undoubtedly be welcomed as an exposition of the ethical thought of Plato in charming English, its correctness and adequacy as an interpretation are sure to be challenged (see also XXVI, *Philosophy*). The Medici Society issues, in its Library of Philosophical Translations, the first volume of *Plotinus: The Ethical Treatises*, translated from the Greek by Stephen Mackenna (1917). The work of the translator and the publisher is as nearly perfect as possible. The edition, if peace permits its completion, will be for long the favorite text of the English reader.

Three doctoral dissertations relating to aspects of Greek literature deserve honorable mention. Angela C. Darkow's *The Spurious Speeches of the Lysianic Corpus* (Bryn Mawr) defends a thesis which, if true, renders questions regarding the genuineness or spuriousness of orations attributed to Greek speech-wrights wellnigh nugatory. Though cleverly done, its results will hardly be accepted. J. W. Beardslee, Jr., writes an interesting and valuable study of *The Use of* Φύσις *in Fifth-Century Greek*

Literature (Chicago). Emily Helen Dutton's *Studies in Greek Prepositional Phrases—διά, ἀπό, ἐκ, εἰς, ἐκ* (Chicago) will be found to be of great use to all careful readers of Greek in determining the meaning of idioms.

There remain to be noticed a number of books concerned only indirectly with Greek literature, but of value to the student of Greek in its larger aspects. John B. Edwards gives us an excellent dissertation on *The Demesman in Attic Life* (Johns Hopkins), and Bertha Carr Rider's *The Greek House: Its History and Development from the Neolithic Period to the Hellenistic Age* (Cambridge University Press, 1916), a doctoral thesis presented to the University of London, gives a useful account of a subject which must interest every reader of Greek.

There are likewise a number of books dealing with aspects of Greek religion. Emily L. Shields, in a Johns Hopkins dissertation on *The Cults of Lesbos*, presents in eminently satisfactory form the literary and inscriptional evidence, but does not greatly advance the interpretation of the facts collected. A study of more significance is Pierre Roussel's *Les Cultes Égyptiens à Délos du iii^{e} au i^{er} Siècle av. J.—C.* (Paris, Berger-Levrault, 1916), which enables us to gauge the influence of the Alexandrian cults in one of the leading centers of Greek religion. Alfred Boissier's *Le Culte de Diane en Suisse et l'Origine du Fraumünster à Zürich* (Geneva, Librairie Kundig, 1916) is an historical study of unusual interest. Rendel Harris' *The Ascent of Olympus* (Manchester University Press, 1917) collects studies of the origins of the cults of Dionysos, Apollo, Artemis, and Aphrodite.

Percy Gardner's *A History of Ancient Coinage, 700-300 B. C.* (Clarendon Press, 1918) is a book of capital importance, being the first attempt to trace the history of Greek coinage. Even if specialists should be able to pick flaws in it, its value to the general student of ancient Greece would still be very great. It is pleasant to welcome another book of even greater interest and importance to the student of the classics. The basis of all our study is the ancient texts, and they depend on manuscripts. A. C. Clark, who in 1914 applied the arithmetical test to the omissions in the text of the Gospels and Acts, now gives us a most illuminating study of the subject in *The Descent of Manuscripts* (Clarendon Press, 1918), dealing with omissions of lines and larger units in the manuscripts of Cicero, Asconius, Plato, and Demosthenes. It is not too much to say that his book will mark an epoch in the critical evaluation of manuscripts and the constitution of classical texts.

LATIN LITERATURE

CHARLES KNAPP

During the year considerable attention has been paid to the three great Latin Poets—Lucretius, Vergil, and Horace. W. A. Merrill, long known for his studies in Lucretius, published in *University of California Publications in Classical Philology* (iv) a text of the *De Rerum Natura.* In this he incorporates many of his own emendations, previously published, and attempts (to my mind, rather unsuccessfully), by typographical devices, to indicate the logical divisions of the text. The typographical devices are awkward, and the headings, set frequently within paragraphs, and sometimes even within a sentence, irritate rather than help. But, since critical editions of classical texts have rarely been produced by American scholars, the book well deserves special mention. In the same *Publications* (iii) Merrill presented a paper, "Parallels and Coincidences in Lucretius and Virgil." The exact measure of Vergil's indebtedness, in language and ideas, to his great predecessor is a matter of prime importance, and so Merrill's record is of service and of much value. But his registration of even the simplest verbal coincidences will, after all, delay the final making of such exact measurement. C. J. Keyser, professor of mathematics in Columbia University, published in the *Bulletin of the American Mathematical Society* an interesting paper, "The Rôle of the Concept of Infinity in the Work of Lucretius" (*Classical Weekly*, xii).

We note next a book by that fine scholar, W. Warde Fowler, *Aeneas at* *the Site of Rome: Observations on the Eighth Book of the Aeneid* (Longmans). Fowler draws an interesting parallel between the mission of Aeneas, founder of Rome, and that of Augustus, whose rule is the culmination of the great career of Rome. Aeneas, by the will of the gods, came to Italy to rescue it from chaos and barbarism; Augustus, after the chaos of the civil wars, sought to restore order and to revivify the worship of the gods. T. F. Boyds, whose *Beasts, Birds and Bees of Virgil*, reached a second edition during the year, published also *Virgil and Isiah: A Study of the Pollio, with Translation, Notes, and Appendixes* (Blackwell). Much as Vergil's famous Fourth Eclogue has been studied, each new treatment of the poem is eagerly welcomed.

Horace and His Age: A Study in Historical Background, by J. F. D'Alton (Longmans), covers well the field with which it undertakes to deal—Horace in his relation to Roman politics, the Augustan revival, religion and philosophy, social problems, popular beliefs, the period of the Epistles, and literary criticism. Though one would have welcomed a discussion of Horace's literary art, seeing that Horace's fame and influence have rested not so much on what he said as on matters of form (the way he treated his themes), lovers of Horace will set the book beside Sellar's *Horace and the Elegiac Poets*, as an indispensable part of their Horatian apparatus.

K. F. Smith presented two more of his instructive and delightful essays, under the title "Martial the Epigrammatist", in the *Sewanee Review*, and "The Poet Ovid," in the *University of South Carolina Studies in Philology*.

Parts of certain Latin authors not heretofore readily accessible in English annotated editions have been made available during the year. J. H. Westcott and E. M. Rankin produced a very useful edition, with good introduction and helpful notes, of the *Julius* and the *Augustus* of Suetonius. Though the *Augustus* has long been available in the scholarly edition by E. S. Schuckburgh, this is the first good annotated edition in English of the *Julius*. Of the *Metamorphoses* of Apuleius only the Cupid and Pysche story has been provided with English notes, in the edition by L. C. Purser, but the notes are cumbersome and wordy, and the book expensive. J. P. Pike published in 1918 *The Short Stories of Apuleius* (Allyn & Bacon). The selection of 13 stories, including the Cupid and Psyche, is good, and the introduction helpful, but the notes are likely to prove too brief to be of service to the ordinary reader. J. P. Postgate has published a good edition of Book VIII of Lucan's *Pharsalia* (Cambridge University Press).

A most interesting and inspiring happening of the last year or two is the fact that in war-worn Italy classical scholars have had the courage to begin a new series of critical text editions of Latin authors, to take its place beside the well known Teubner Series and the Oxford Classical Text Series. The new series, which is under the general editorship of Carlo Pascal, is known as the *Corpus Scriptorum Latinorum Paravianum* (it gets the name *Paravianum* from the publishers, I. B. Paravia & Co., Rome, Turin, etc.). The small, convenient, and attractive volumes thus far published, at extremely low prices, include Catullus; Caesar, *De Bello Civili;* Cicero, *De Re Publica;* Minucius Felix, *Octavius;* Plautus, *Stichus;* Plautus, *Captivi;* Tacitus, *Agricola;* Tacitus, *Germania;* Vergil, *Eclogues*, *Moretum*, *Copa*, in one volume, the *Catalepton*, *Maecenas*, and the *Priapeum*, *Quid Hoc Novi Est*, in another; Ovid, *Tristia;* Ovid, *Ars Amatoria;* Tacitus, *Dialogus;* Cicero, *Pro Milone*, *Pro Archia*.

W. P. Mustard, well known for his work on late Latin authors, has put classical scholars still further in his debt by his edition of the *Eclogues* of Faustus Androlinus and Iohannes Arnolletus, with good introduction and notes that point out reminiscences of classical authors.

Translations of classical writings seem to come in a steady stream from the presses. Here two must be named, Volume II of a translation of Plautus, by P. Nixon, and a rendering of Juvenal and Persius, by G. G. Ramsay. These works form part of the *Loeb Classical Library*. Nixon's translation is full of life, though at times there is too much straining after effect, particularly in the translation of the various expletives.

For some years past much labor has been expended in the effort to trace the influence of classical writings on English literature. Thus, in 1913, W. T. Myers issued *The Relations of Latin and English During the Age of Milton* (Ruebush-Elkins Co., Dayton, Va.). In 1916 appeared *The Influence of Horace on the Chief English Poets of the Nineteenth Century*, by Mary Rebecca Thayer (Yale University Press), and "Goethe's Estimate of the Greek and Latin Writers", by W. J. Keller (Univ. of Wis. Bull. No. 786). In 1918 Elizabeth Nitchie presented, in an interesting paper, *The Classical Journal* (xiii, 393), "Horace and Thackeray"; Caroline Goad published a very elaborate study (641 pages), *Horace in the English Literature of the Eighteenth Century* (Yale University Press); and W. Chislett, Jr., published *The Classical Influence in English Literature in the 19th Century* (Stratford & Co., Boston).

A very important work, on its surface, indeed, devoted exclusively to Greek things, must be mentioned: *The Greek Theater and Its Drama*, by R. C. Flickinger (University of Chicago Press)., By adding much to our understanding of the Greek theatre, this book will minister to a fuller and surer understanding of the two great Roman writers of comedy, Plautus and Terence, whose works are in every case based on Greek originals. (See also *Greek Literature, supra.*)

Lastly, we mention *The Unwilling Vestal*, by Edward Lucas White (Dutton). The author is a teacher of Latin, but also a novelist of distinction (witness his *El Supremo*). For *The Unwilling Vestal* he made a careful study of all the ancient passages bearing on the Vestal Virgins. Granting the correctness of his picture of the Vestals on the archaeological side (there are, I think, few, if any, errors here), I question the psychology of the book; the author makes his heroine, before she is 12, capable of a grand passion for the hero (a strange person, surely), to which she adheres during all the 30 years of her unwilling service as Vestal.

SEMITIC PHILOLOGY AND LITERATURE

Morris Jastrow, Jr.

The Oriental Club of Philadelphia has published, in commemoration of its thirtieth anniversary, a survey of *Thirty Years of Oriental Studies.* The volume contains an article on "Thirty Years' Progress in Semitics," by Dr. John P. Peters, New York, with a supplementary account by Professor Jastrow of the University of Pennsylvania, followed by a survey of "Thirty Years of Indo-European Studies", by Prof. E. W. Hopkins of Yale University (see also *Indo-European Philology, infra*). The record is particularly gratifying as showing the large part taken in scientific activity both in Semitic and Sanskrit fields by American scholars during the past three decades.

The war has made a serious interruption of scientific work in this country as well as abroad in the field of Oriental studies as in all other branches of scientific work. The record for the year 1918 is therefore somewhat meagre. One notable undertaking of general interest which was completed during the year is the series of *Sacred Books and Early Literature of the East*, edited by Charles F. Horne and comprising no less than 17 volumes. It includes selections from the entire domain of ancient and mediæval Eastern literature, beginning with Babylonia and Assyria and ending with selections from the Apocryphal books of the Old and New Testaments. The translations have been prepared or revised by reliable scholars, and the work, covering a very wide field, in Egypt, Persia, Arabia, Palestine, India, China, Japan, is invaluable as a general reference work, containing a mass of material not found elsewhere.

Another series, *The Mythology of Races*, edited by Dr. L. H. Gray, is making steady progress, signalized by the appearance during the year of a notable volume on *Egyptian Mythology* by W. Max Müller of the University of Pennsylvania. While many of Dr. Müller's views will encounter opposition from his fellow Egyptologists, yet all will recognize the great value of this attempt to penetrate into the inner meaning of the strange beliefs and still stranger speculations found among the ancient Egyptians as revealed by the monuments and by Egyptian texts.

George A. Barton of Bryn Mawr College has added to his previous volumes on Sumerian and Babylonian texts another under the title of *Miscellaneous Babylonian Inscriptions* (Yale University Press). The texts are from the collections in the University of Pennsylvania Museum and should have found a place in the Series published by that institution. The texts are of the very first importance and contain, among other things, a number that throw further light on the early Sumerian view of the creation of the world and of man.

S. A. B. Mercer has compiled a *Sumero-Babylonian Sign List* (Columbia University Press, 1918) which, while it adds nothing new to what was already known, yet may be of use in studying the development of the signs from their archaic to their late forms.

An elaborate series of studies in "Biblical Parallelism" has been issued conjointly by Prof. William Popper of the University of California and Dr. Louis I. Newman. Dr. Popper confines himself to Chapters 1 and 10 of Isaiah, while Dr. Newman takes up the parallelisms in the Book of Amos. The main purpose of the investigation is to establish, through detailed investigation of the literary form in the Prophets, a basis for textual criticism, and more particularly to separate later additions from the original portions of the utterances of the Prophets. A large part of Dr. Newman's work is taken up with parallel methods of composition among the Chinese, Sumerians, and the Finns, as well as in the Syriac and the later Rabbinical literature. The theory remains to be tested.

Perhaps the most important publication of the year in the field of Semitic philology is a volume on *Lydian Inscriptions* by Enno Littmann of Strassburg University, setting forth the results of the excavations at Sardis carried on under the auspices of the American Society for Excavations at Sardis and published by the Society. Hitherto about 13 more or less fragmentary Lydian inscriptions had been published. This number is now considerably enlarged by the discoveries at Sardis, and of special interest and value is a bilingual—Lydian and Aramaic—of considerable length. With the help of the Aramaic as a key Professor Littmann has succeeded in identifying the majority of the characters of the Lydian alphabet, though even with this scarcely more than the beginning of a decipherment of Lydian inscriptions has been rendered possible. The Aramaic translation accompanying the Lydian inscription has been successfully read by Professor Littmann and turns out to be of a mortuary character, dated in the tenth year of King Artaxerxes. The king meant is probably the first of that name, with the surname Longimanus, which would date the inscription date about the middle of the fifth century B.C. It is interesting to thus find the evidence for a considerable Aramaic-speaking population in western Asia Minor at this early period.

INDO-EUROPEAN PHILOLOGY

(*Exclusive of the Germanic languages*)

ROLAND G. KENT

For several years studies in the origins of the separate cases of nouns in the original Indo-European speech have been appearing, and several of these have been noted in the YEAR BOOK. A careful study of the dative case by Walter Petersen, "Syncretism in the Indo-European Dative" (*Am. Jour. Philol.*, xxxix, 1 and 117), reaches the following conclusions:

> The Indo-European dative was in origin an uninflected case of the secondary object, which had certain points of contact with a local case somewhat like the locative in the singular and with the ablative in the plural; from this partially common sphere of usage complete syncretism resulted, so that the uninflected case gave way everywhere to the clearer inflected originally local forms. . . . This theory of the syncretistic origin of the dative avoids the objections to both local and grammatical theories, combines the advantages of both, and explains other features which both of the other theories cannot explain.

With this interpretation one may compare the somewhat divergent theories of two other American scholars, E. W. Hopkins, who deals especially with the dative in the Hindu Vedas (*Trans. Am. Philol. Assoc.* xxxvii, 87, and *Jour. Am. Oriental Soc.*, xxviii, 360), and E. W. Fay, speaking on the syntax of the case in Latin (*Class. Quart.*, v, 190).

Hopkins takes up also the "Origin of the Ablative Case" (*Jour. Am. Oriental Soc.*, xxxviii, 47), and noting that it comprises forms ending in *-os*, identical with the genitive singular or with the dative plural, forms in -d. starting in pronouns as a pseudo-accusative stem form, and forms ending in an adverbial *-tos* of no distinctly specialized meaning, he concludes that the ablative case was a grammatical luxury which developed into a "from" case by a process of specialization.

The tendency of such studies seems to be bringing us near the view that the case system of Indo-European rests upon the use of five elements, *s*, *m*, *d*, *i*, *bh*, of vague significance, gradually specialized in meaning and combined with one another to form additional endings.

Hopkins has also a valuable account of "Thirty Years of Indo-European Studies" in a volume entitled *Thirty Years of Oriental Studies*, issued in commemoration of 30 years of activity by the Oriental Club of Philadelphia (see also *Semitic Philology, supra*). The writer sketches the progress in the field from 1888 to 1918, with a valuable bibliography of the most important books, and a consideration of the promise of the future. It might be noted also that the American Oriental Society, at its meeting in New Haven in April, 1918, celebrated the seventy-fifth anniversary of its incorporation.

A. H. M. Stonecipher, in his *Graeco-Persian Names* (Vol. IX of the *Vanderbilt Oriental Series*), presents the ancient Persian names that appear in Greek texts, gives their presumable Persian forms and etymologies, and tabulates the phonetic and etymological results in a well systematized way which will be of great value to classicists and to Iranists alike.

The dependence of the study of ancient Indic and Persian religions upon philological studies is such that treatises in these fields belong as much to philology as to religion. In the volume entitled *Religions of the Past and Present*, a series of lectures delivered by members of the faculty of the University of Pennsylvania and edited by J. A. Montgomery, there are chapters on "The Religion of the Veda," "Buddhism," and "Brahmanism and Hinduism," by Franklin Edgerton, and on "Zoroastrianism," by R. G. Kent, which present these themes in a brief and semi-popular yet scholarly form.

L. C. Barret continues his publication, with critical notes, of the Kashmirian Atharva Veda; this installment is Book V, containing 40 hymns, of which 25 are substantially new, not occurring in other versions of the Vedas (*Jour. Am. Oriental Soc.*, xxxvii, 257).

The valuable studies of W. H. Schoff in the commerce of the ancient Orient are further exemplified in his "Navigation to the Far East under the Roman Empire" (*ibid.*, 240), which, like his previous articles, is a contribution not only to the history of ancient trade, but to the interpretation of the *Peripli* or coasting voyages of merchants which have come down to us in Greek.

The study of the formation of noun stems in Greek continues to receive careful treatment. C. D. Buck, in "Studies in Greek Noun-Formation: Dental Terminations I. 4" (*Class. Phil.*, xiii, 75), handles in detail notably χάρις, θέμις, ἄναξ, and their compounds, with careful citations of the sources of many words not readily ascertainable from previous monographs or lexica. C. W. Peppler has presented (*Am. Jour. Philol.*, xxxix, 173) the fourth part of his "Comic Terminations in Aristophanes" (Part 1, printed separately at Baltimore in 1902; parts 2 and 3, in *Am. Jour. Philol.*, xxxi, 428, and xxxvii, 459), which is important in revealing how derivative words—some familiar, some unusual, and some entirely new—were employed to convey humorous touches in ancient Greek. From his studies it is easily seen that modern humorists in coining strange words to provoke a laugh are but following a very ancient procedure.

XXX. EDUCATION AND EDUCATIONAL INSTITUTIONS

W. CARSON RYAN, JR.

American education in 1918 underwent more fundamental changes than in any previous year on record. The war brought problems and it also brought opportunities. The colleges and universities passed through a period of intense war preparation, complete devotion to military needs, and ultimate resumption of peacetime work. The secondary schools worked feverishly to do war work and to retain their pupils, tempted away by the unprecedented labor market (see XIV, *Child Welfare;* and XV, *Labor*). Elementary schools found the opportunity of their existence in bringing into the schools the teeming national life that for the moment was concentrated on the all-important task of winning the war. The nation as a whole was drawn rapidly into an interest in educational problems second only to the immediate military interests of the moment and originating directly in these.

EDUCATION AS A NATIONAL CONCERN

A Developing National Sense in Education.—Attention was called in these pages a year ago (*A. Y. B.*, 1917, p. 739) to the steady development of the idea of education as a national concern. The movement then noted has made rapid progress during the war and has shown little indication of abating since the armistice was signed. A period of thinking nationally has had its effect on educaton as on few other things. Illiteracy, ignorance of the English language, poorly prepared teachers, physical difficulties, and low salaries for educational work are all felt as national problems in a sense that was not the case before the war.

Federal Agencies for Education.—One of the first impressions of those who came to Washington early in the war to direct war enterprises was surprise at the lack of any kind of national administration of schools, or at least machinery to put into all the schools the war projects of the Federal Government. To be sure, there was the Bureau of Education, created as a separate department in 1867; but it had no authority, and had only recently begun to develop machinery for reaching the educational forces of the country. There was the Federal Board for Vocational Education, an independent agency established by Congress in the same month that America broke off relations with Germany, but its field of activity was clearly limited, and embraced only a small part of what the nation would demand of educational institutions for the service of the war.

There were a host of other Federal agencies doing educational work. Indeed, it was not that the Federal Government had failed to concern itself with education, but that it had failed to set up any central agency for its many activities. Half a hundred separate Federal educational agencies were spending 30 or 40 million dollars, even in normal times, in direct educational tasks that extended from northernmost Point Barron, in Alaska, to the Philippines on one side of the world and Porto Rico on the other, including a comprehensive system of schools for Indians and a very extensive system of agricultural education through the demonstration and extension work and the boys' and girls' clubs of the Department of Agriculture (see XVI, *Agriculture*).

The war increased the number of these educational agencies considerably. Each new branch of the Government sought to call upon the schools and the teachers of the country to help win the war—in food, in money, in morale—and either deeming the existing machinery insufficient or not knowing what machinery did exist, promptly put into effect a scheme of its own. The Council of National Defense had its Committee on Engineering and Education. The Food Administration set up a division of elementary schools and later a collegiate section. The Fuel Administration endeavored to have the state school authorities designate a holiday in which school children would tag coal shovels. The Junior Red Cross was organized with an ambitious educational programme for all grades of schools and for both sexes. The Treasury Department created a Division of Education to promote the sale of thrift stamps and war savings certificates through the schools. The War Department began building up under the Ordnance Department of the Army a system of schools for munitions-plant communities, while under the Chief of Staff the same Department created a Committee on Education and Special Training to train men at colleges and schools for technical service in the Army.

A complete and accurate list of the educational activities of the Federal Government, including the war-time activities, will probably never be possible. The list, given below, compiled from first-hand reports of the offices involved or from official printed sources, may be regarded as a minimum list to which other names may be added. It is worth noting that this work is scattered among half a hundred different agencies in 23 distinct departments, bureaus, or commissions. It has been estimated that the work done by at least 35 of these agencies, representing an expenditure of close to 30 millions of dollars, could profitably be brought together into a single adequately equipped Department of Education, and that, given such a Department, the remaining educational agencies would either come into the Department or at any rate find it valuable to coöperate very definitely with it in educational work.

In the statement that follows the educational activities of the Federal Government are listed under three groups. Group 1 includes agencies whose functions are such as to mark them clearly for a Department of Education. Group 2 includes establishments whose actual inclusion in a Department of Education would be problematical, but whose effectiveness would undoubtedly be increased by some form of coöperation with the proposed Department. Group 3 is a supplementary list of scientific agencies of the Government that would constitute an essential source of information for a Department of Education and would find in such a Department an exceedingly valuable channel of communication. Wherever obtainable, especially in Group 1, the date of establishment and the official description of the work are given.

GROUP 1. NUCLEI OF A FEDERAL DEPARTMENT OF EDUCATION

DEPARTMENT OF THE INTERIOR

Bureau of Education (Alaska, general), 1867.—"Collects statistics and general information showing the condition and progress of education, issues an annual report, a bulletin in several numbers annually, and miscellaneous publications; has charge of the schools for the education of native children in Alaska; supervises the reindeer industry in Alaska, and administers the endowment fund for the support of colleges for the benefit of agriculture and mechanic arts."

Office of Indian Affairs (Indian schools), 1873.—"The Office of Indian Affairs has charge of the Indian tribes of the United States (exclusive of Alaska), their education, lands, moneys, schools, purchase of supplies, and general welfare."

Colleges of Agriculture and Mechanic Arts, 1862, 1890.—Administered through the Bureau of Education; include:

Howard University, 1867.
National University for colored men.
Columbia Institution for the Deaf, 1864.
Gallaudet College.

WAR DEPARTMENT

Bureau of Insular Affairs (education in Philippine Islands and Porto Rico), 1900.—Has charge of all matters pertaining to civil government in the island possessions of the United States subject to the jurisdiction of the War Department.

Army Post Schools.—"A school for instruction of enlisted men in the common branches of education, and especially in the history of the United States, is maintained at each post. Instruction is given under the supervision of officers by teachers detailed from the enlisted men."

Vocational Education in the Army, 1916.—"In addition to military training, soldiers while in active service shall hereafter be given the opportunity to study and receive instruction upon educational lines of such character as to increase their military efficiency and enable them to return to civil life better equipped for industrial, commercial and general business occupations. Civilian teachers may be employed to aid the Army officers in giving such instruction, and part of this instruction may consist of vocational education either in agriculture or mechanic arts."

Office of the Surgeon-General.—Physical reconstruction, including vocational education in the hospitals.

Committee on Education and Special Training, 1918.—Students' Army Training Corps, both collegiate and vocational units.

Commission on Training Camp Activities.—Committee on education, education in cantonments.

Ordnance Department. — Schools at munitions plants.

NAVY DEPARTMENT

State Marine Schools, Massachusetts and New York, 1917.

Academic Education in Training Schools, 1913.—"Until very recently academic education has not been part of the training station's system, but within the past few months this has been made an important part of the training" (1913).

Correspondence Schools, 1914.—"An officer on board ship will be assigned to supervise and assist the work of all enlisted men who, by reason of their initiative and ambition, may have taken up correspondence courses with outside institutions."

Instruction for Enlisted Men on Board Ship, 1914.—"The plan for the instruction of enlisted men, petty officers and warrant officers of the Navy serving on board ship was put into effect Jan. 1, 1914, with a view to supplying deficiencies in academic education, and also to provide systematic means by which all enlisted men and warrant officers may receive assistance and encouragement in technical branches in order to fit them for promotion in the Navy, as well as for civil trades at the end of their period of service afloat.".

Education in Samoa, Guam and Virgin Islands.—The civil government of these islands is under the Navy Department, and schools are included as part of the civil administration.

DEPARTMENT OF JUSTICE

National Training School for Boys.

TREASURY DEPARTMENT

Public Health Service.—The investigation of school hygiene is given as one of the topics under the Division of Scientific Research.

National War Savings Committee.

DEPARTMENT OF AGRICULTURE

States Relation Service, 1906, 1914.—"The States Relation Service represents the Secretary of Agriculture in his relations with the state agricultural colleges and experiment stations, under the acts of Congress granting funds to these institutions for agricultural experiment stations and coöperative extension work in agriculture and home economics, and in carrying out the provisions of acts of Congress making appropriations to this Department for farmers' coöperative demonstration work, investigations relating to agricultural schools, farmers' institutes and home economics."

DEPARTMENT OF LABOR

Bureau of Naturalization (citizenship education), 1914.—"In its administration of the naturalization laws the Bureau obtains the coöperation of the public school authorities throughout the United States, receives reports therefrom of courses in citizenship instruction and, acting as a clearing house of information on civic instruction, it disseminates information received throughout the public school system."

Bureau of Labor Statistics (industrial education), 1907.—"The Bureau of Labor Statistics is charged with the duty of acquiring and diffusing among the people of the United States useful information on subjects connected with labor, especially upon its relations to capital, the hours of labor, the earnings of laboring men and women, and the means of promoting their material, social, intellectual and moral prosperity." Much of the pioneer industrial educational work was done by this bureau.

Children's Bureau, 1911.—"The act establishing the Bureau provides that it shall investigate and report upon all matters pertaining to the welfare of children and child life among all classes of our people."

United States Employment Service, 1917.—Through the Boys' Working Reserve this service seeks to utilize boys of high-school age in farm occupations. Through the professional division an attempt is made to place teachers.

INDEPENDENT AGENCIES

Federal Board for Vocational Education, 1917.—"The duties imposed upon the Board are of twofold character: First, it is the representative of the Government appointed to coöperate with boards appointed by the states in promoting vocational education; and second, it is required to make, or cause to have made, reports on vocational subjects." It is also charged with the reeducation of soldiers.

Pan American Union.—Division of Education, created by resolution of the Second Pan-American Scientific Congress to serve as a clearing house on educational matters for the Latin-American countries.

The Panama Canal.—Education in the Canal Zone.

The American National Red Cross:
Junior Red Cross, 1917.
Reëducation of disabled soldiers.

The United States Shipping Board.—Training of shipyard workers.

Council of National Defense.—Advisory Commission, Committee on Engineering and Education.

Food Administration:
Collegiate Section.
Community and national life leaflets.

Committee on Public Information:
Division of Education and Civic Publications (non-transferable to the Interior Department).
Junior Four-minute Men.

GROUP 2. AGENCIES THAT COULD PROFITABLY BE COORDINATED WITH A DEPARTMENT OF EDUCATION

WAR DEPARTMENT:

Military Academy
Army service schools
Garrison schools
Special service schools
Army War College
Military equipment for schools and Colleges

NAVY DEPARTMENT:

Naval Academy
Naval War College
Naval training stations and special schools

SMITHSONIAN INSTITUTION.—"An establishment for the increase and diffusion of knowledge among men."

BOTANIC GARDEN.

PUBLIC SCHOOLS OF THE DISTRICT OF COLUMBIA.

GROUP 3.—SCIENTIFIC RESEARCH OR OTHER AGENCIES

DEPARTMENT OF AGRICULTURE:

Bureau of Animal Husbandry
Bureau of Plant Industry
Forest Service
Bureau of Chemistry
Bureau of Soils
Bureau of Entomology
Bureau of Biological Survey
Office of Public Roads
Bureau of Markets
Federal Horticultural Board

DEPARTMENT OF LABOR:

Bureau of Immigration

DEPARTMENT OF COMMERCE:

Census Office
Bureau of Standards

NAVY DEPARTMENT:

Bureau of Medicine and Surgery
Bureau of Steam Engineering
Hydrographic Office

CIVIL SERVICE COMMISSION.

DEPARTMENT OF THE INTERIOR:

Geological Survey
Bureau of Mines

COMMITTEE ON FINE ARTS.

UNITED STATES GEOGRAPHIC BOARD.

GOVERNMENT PRINTING OFFICE:
Superintendent of Documents

DEPARTMENT OF STATE:
Division of Foreign Intelligence

TREASURY DEPARTMENT:
Public Health Service.

The Demand for Coördination.—With the schools subject to constant calls, not only from public and semipublic agencies, but from a host of private charities and funds, demand soon came for coördination and centralization. Early in January, 1918, the Association of American Colleges, meeting at Chicago, adopted a resolution calling upon the President of the United States "to take steps looking toward the immediate comprehensive mobilization of the educational forces of the nation for war purposes under centralized administration." On Jan. 12 and 13 members of the executive committee of a number of educational organizations—the Association of American Colleges, the Association of American Universities, the Catholic Educational Association, and the National Association of State Universities—together with representatives of a municipal University, an agricultural college, a university of school education, and a city school system, met and discussed this resolution, the conclusion reached being that all existing educational agencies, including the elementary and high schools, the colleges and universities, and the various governmental and voluntary organizations engaged in educational work, should be at once brought together for a more effective practical coöperation for war purposes; and that this result could be secured only by the action of the President of the United States. It was taken for granted that "this unifying Federal organization would assume no extra-legal coercive powers and would require no such powers to secure the desired result."

Conferences held in Washington immediately afterward resulted in the formation of the Emergency Council on Education, later known as the American Council on Education, with the object of placing the resources of the country more completely at the disposal of the National Government and its departments, to the end that "through an understanding coöperation" their patriotic service might be augmented, a continuous supply of educated men maintained, and preparation for the great responsibilities of the reconstruction period anticipated. The membership included the following organizations:

Association of American Universities
Association of State Universities
Association of American Colleges
American Association of Agricultural Colleges and Experiment Stations
Catholic Education Association
Association of Urban Universities
National Education Association
National Education Association, Department of Superintendence
National Council of Education
American Association of University Professors
Society for the Promotion of Engineering Education.

The Movement for a Federal Department of Education.—The attempts to coördinate the Federal Government's educational activities in war time led to a vigorous revival of a project long discussed but hitherto not very seriously considered—a Federal Department of Education. The National Education Association Commission on the Emergency in Education, formed to consider educational problems both of the war and of reconstruction, studied the nation's educational needs as revealed by the war, and worked for some time on proposed legislation. Finally, on Oct. 10, Senator Hoke Smith of Georgia, chairman of the Senate Committee on Education and Labor, "on his own account and at the request of the National Education Association and the Association of College Presidents" introduced a bill "to create a Department of Education, to appropriate money for the conduct of said department, to appropriate money for Federal coöperation with the states in the encouragement and support of education, and for other purposes." The bill was referred to the Committee on Education and Labor.

Some of the more important provisions are as follows:

That there is hereby created an executive department in the Government, to be called the Department of Education, with a Secretary of Education, who is to be the head thereof, to be appointed by the President, by and with the advice and consent of the Senate, who shall receive a salary of $12,000 per annum, and whose tenure of office shall be like that of the heads of other executive departments.

That there shall be in said department at least three Assistant Secretaries of Education, to be appointed by the President, each of whom shall receive a salary of $10,000 per annum.

That there be transferred to the Department of Education the Bureau of Education and such educational war-emergency commissions or boards or educational activities already established by act of Congress as in the judgment of the President should be transferred to the Department of Education.

The President of the United States is hereby empowered in his discretion to transfer to the Department of Education such offices, bureaus, divisions, boards, or branches of the Government connected with or attached to any of the executive departments, or organized independently of any department, devoted to education matters which concern the United States as a whole or the educational system of any State or States of the Union, which in his judgment should be controlled by, or the functions of which should be exercised by, the Department of Education.

That it shall be the specific duty of the Department of Education to coöperate with the States in the development of public educational facilities, including public-health education, within the respective States.

That there is hereby appropriated to the Department of Education the sum of $500,000 annually, to be available from and after the passage of this act, for the purpose of paying salaries and conducting investigations and of paying all incidental expenses, including traveling expenses, and rent where necessary, and for the purpose of allowing the Department of Education to inaugurate a system of attachés to American embassies abroad to deal with educational matters.

That in order to coöperate with the States in the promotion of education, as hereinafter specified, there is hereby appropriated, out of any money in the Treasury not otherwise appropriated, the following sums: For the fiscal year ending June thirtieth, nineteen hundred and twenty, and annually thereafter, $100,000,000.

That in order to coöperate with the States in the abolition of illiteracy, three-fortieths of the sum annually appropriated by section eleven of this act shall be used for the instruction of illiterates ten years of age and over.

That in order to coöperate with the States in the Americanization of immigrants, three-fortieths of the sum annually appropriated by section eleven of this act shall be used to teach immigrants ten years of age and over to speak and read the English language and the duties of citizenship, and to develop among them an appreciation of any respect for the civic and social institutions of the United States.

That in order to coöperate with the States in the efforts to equalize educational opportunities, five-tenths of the sum annually appropriated by section eleven of this act shall be used for the improvement of public schools of less than college grade, with the definite aim of extending school terms and of stimulating State and local interest in improving, through better instruction and gradation and through consolidation and supervision, the rural schools and schools in sparsely settled localities.

That in order to coöperate with the States in the promotion of physical and health education and recreation two-tenths of the sum annually appropriated by section eleven of this Act shall be used for physical education and recreation, and medical and dental examination of children of school age, the determination of mental and physical defects in such children, the employment of school nurses, the establishment and maintenance of school dental clinics, and the instruction of people in the principles of health and sanitation.

That in order to coöperate with the States in preparing teachers for the schools, particularly rural schools, three-twentieths of the sum annually appropriated to the States by section eleven of this Act shall be used to prepare teachers, to encourage a more nearly universal preparation of prospective teachers, to extend the facilities for the improvement of teachers already in service, to encourage through the establishment of scholarships and otherwise a greater number of talented young people to make adequate preparation for public-school service, and otherwise to provide an increased number of trained and competent teachers.

In order to secure the benefits of the various appropriations, it will be necessary for the states to accept the provisions of the act, designate the chief educational authorities to coöperate with the Federal Department of Education, and appropriate an equal amount from state or local funds. It is also provided that no state shall be allowed to participate in any of the apportionments unless it has within two years after the passage of the act a satisfactory system of preparing teachers. The Secretary of Education is authorized to frame rules and regulations to carry out the provisions of the act.

HIGHER EDUCATION AND THE WAR

Principles of College Coöperation.—In the other countries at war the colleges and universities had early sent all their men into military service and were almost completely without students. As a result the loss of technically trained men and officer material had become seriously felt. Acting on the advice of the Allies, the American authorities made a determined effort to avoid this mistake, first by using the research facilities of the institutions, then by urging men to stay in college to fit themselves more completely for war service, and finally by turning the colleges and normal schools into army posts and utilizing the educational plant for training the men needed for immediate service.

Scientific Contributions of the Colleges.—Before the first year of American participation had passed, nearly a hundred colleges and universities had offered their entire plants and equipment to the Government for carrying out exhaustive experiments that had been planned in chemistry, physics, and engineering related to the war. The National Research Council (see I, *War Organization*), created by the Council of National Defense, was the central agency by which the vast programme of scientific research was carried on for Government departments of war service. The Council availed itself of the best talent of the nation, and assigned to a score or more of educational institutions the study of problems related to military optics, ordnance, munitions, topography, and food conservation. One of the most important contributions, according to the annual report of the Commissioner of Education, has been that of psychology to the problems concerned with the selection of the right men for the different kinds of service required in the Army and Navy. "The methods applied by the psychologists," says the report, "have almost completely revolutionized the methods of organizing Army and Navy personnel."

Among the great number of problems that have been under investigation may be mentioned: food conservation, wheat and flour substitutes, gas defense, dyes, devices for the

Navy, high explosives, electrical problems connected with wireless, methods of preserving edible fish, powder research, smoke screens, utilization of wood waste to produce acetic acid, a very light military bridge, gas engines, optical problems relating to gun sights, analysis of suspected foods, lignite coal for war purposes, sugar beets, porous basalt for concrete, detection of submarines, making cellulose from pine straw, testing of steel, bronze and wood, testing of automobile parts, testing of paints and varnishes and oils, special research in pathology, and military research and special testing in naval tank.

Secretary Lane's Special Committee.—The need for a specific war programme for higher institutions to meet the nation's requirements in technically trained men was presented early in 1918 by a special Committee on Higher Education and Industry, appointed by the Secretary of the Interior, Franklin K. Lane. The Committee consisted of Fuller E. Callaway, a financier of Lagrange, Ga.; Samuel M. Felton, director-general of military railways for the War Department, and President E. A. Alderman of the University of Virginia. In its report the Committee pointed out how essential it was, if the Government's farreaching military plans were to be carried out successfully, that the processes of higher education be maintained at the highest possible efficiency, especially those having to do with the future supply of men and women trained in scientific and technical subjects, including teachers in these fields. The report showed that it was impossible to exaggerate the importance of engineering knowledge and skill in the broadest sense, not only directly in the conduct of military operations, but indirectly in the essential war industries, including agriculture. The following recommendations were presented by the committee as a programme for the nation:

> The people of the United States should recognize that the maintenance of the war strength of the nation in its full power demands the utmost efforts of all existing well organized and adequately equipped colleges, universities, and technical schools. This means ever increasing and more devoted bodies of students as well as faculties.
>
> Young people having the requisite qualifications should heed this urgent call of their country and apply themselves diligently, enthusiastically, and in increasing numbers to the task of preparing for the highest service of which they are capable.
>
> Institutions of higher education should adjust their courses, so far as possible, to immediate war needs and to the demands which must inevitably come with the establishment of peace, and should develop especially those scientific and practical branches of study which are essential to the winning of the war, to the development of our industries and commerce, and to the accomplishment of the tasks of the civic and political life of the nation.
>
> Educational institutions should use every effort to make the opportunities and privileges of training for public service accessible to all suitably prepared men and women of college age. In the cases of many worthy young men and women this will require some provision for assistance in meeting payments for tuition and laboratory fees and other necessary expenses of higher technical training.

The Students' Army Training Corps.—In September, 1918, following the passage of the Man Power Act, fixing the age limits for selective service from 18 to 45, the Committee of Education and Special Training of the War Department carried out the plan of establishing units of a Students' Army Training Corps in all colleges and universities which offered a minimum enrollment of 100 students above high-school grade. This task of transforming over 500 institutions of higher learning into institutions of military training was accomplished quickly and with a minimum amount of friction. By a single stroke the colleges of the country were saved from almost virtual extinction, while the nation was able to provide at a moment's notice the highest type of instruction necessary in training the host of new officers for the Army of 1918-19.

The War Department's general circular announced the purpose of the Students' Army Training Corps as follows:

> *Purpose.*—The primary purpose of the Students' Army Training Corps is to utilize the executive and teaching personnel and the physical equipment of the educational institutions to assist in the training of our new armies. Its aim is to train officer candidates and

technical experts of all kinds to meet the needs of the service. This training is conducted in about 550 colleges, universities, professional, technical, and trade schools of the country.

Vocational and Collegiate Sections.—The Corps is divided into two sections. The collegiate or "A" section and the vocational or "B" section were formerly known as National Army training detachments. They aim to train soldiers for service as trade specialists in the Army. As the programme for vocational training is now virtually completed, few, if any, new units of this type will for the present be added.

The "A" or collegiate section, which was inaugurated on Oct. 1, was open to draft registrants who were members of some authorized college, university, or professional school. Students of authorized institutions joined the Students' Army Training Corps by voluntary induction into the service. They thus became members of the Army on active duty, receiving pay and subsistence, subject to military orders, and living in barracks under military discipline in exactly the same manner as other soldiers. The housing, subsistence, and instruction of soldiers in both branches of the Students' Army Training Corps were provided by educational institutions under contract with the Government. Under the war programme all curricula of the Students' Army Training Corps were based on quarterly courses of 12 weeks each, including examination periods.

The Students' Army Training Corps had but a few weeks to demonstrate its posibilities before the armistice was signed. It was at first planned to continue the work for the year on a somewhat modified basis, but after carefully going over the situation the War Department issued orders on Nov. 26 for the demobilization of all the units, and by the end of the year the Students' Army Training Corps went out of existence. The demobilization order contained the following comment:

> The Students' Army Training Corps was conceived as a war measure to operate under war conditions. The conclusion to discontinue under the present conditions has been reached with regret and only after a careful canvass of the situation from every point of view. This Committee desires to express its appreciation of the loyal spirit with which the educational institutions of the country have coöperated in this undertaking.

Return to normal conditions was effected much more quickly than was believed possible. The demobilization began on Dec. 2 and was practically completed by Dec. 26, and nearly all the colleges reported at the end of the calendar year that they were now almost entirely on a pre-war basis as far as attendance and courses were concerned. The prevailing opinion as to the success of the plan is thus stated by the *Harvard Alumni Bulletin:*

> There appears to be a general agreement, at Harvard and elsewhere, that as an instrument of education the S. A. T. C., now passing out of existence, has not been a success. Before it disappears from the Harvard landscape we should like to express again the belief, already set forth, that its general scheme was intelligently devised to meet a pressing emergency—that of the quick sifting out of sorely needed officer material. The difficulties have been that the scheme had to be put into practice with extreme speed, before its machinery could be put to the smallest test, and that the sudden collapse of the war rendered it superfluous before it got a full chance to discover and mend its own shortcomings.

College Attendance, 1913-1918.—The Students' Army Training Corps had at least the effect of preventing the complete wiping out of college attendance. Because of a change in the method of collecting figures, the latest Government statistics available are for 1914-15 in the case of private colleges and universities, and 1916-17 for state universities. The table on the following page is based in part upon Government figures and in part upon estimates of college officers, as published in the *American College Bulletin:*

The Council of Church Boards of Education draws this conclusion with regard to the effect of the S. A. T. C. on the colleges:

> Unquestionably the training corps units have been a powerful factor, not only in maintaining the attendance of last year, but in bringing the colleges to a higher level than was anticipated. Some of the striking features of this change are noted below:
>
> 1. The number of regular students of college grade only in state institutions as indicated by returns from 75 universities and colleges has increased 10 per cent.

COLLEGE ATTENDANCE, 1913-1918

	Public Institutions (Excluding Normal)				Private Institutions			
	Number	Attendance			Number	Attendance		
		Men	Women	Total		Men	Women	Total
1913–14.........	......	57,354	26,040	83,394	......	73,134	46,871	120,005
1914–15.........	95	62,384	29,157	91,541	468	79,452	50,606	130,058
1916–17.........	90	70,278	35,498	105,776	468	84,500	53,500	138,000
1917–18.........	90	53,000	36,000	89,500[1]	468	59,000	55,000	114,000[2]
1918–19.........	90	63,400	35,500	98,400[3]	468	79,000	53,000	132,000[4]

[1] 13.6 per cent. loss, 50 reporting.
[2] 17 per cent. loss, 230 reporting.
[3] 10 per cent. increase, 73 reporting.
[4] 12 per cent. increase, 125 reporting.

2. The number of regular students of college grade only in private institutions as indicated by returns from 125 colleges has increased 12 per cent.

3. These increases are primarily in the attendance of men. Twenty-six institutions for men only show an average increase of 23 per cent. Twelve institutions for women only report moderate gains on the average, but not enough to affect general returns. The attendance of women both in state and private coeducational institutions has fallen off six per cent. as compared with last year.

It is evident from this brief statement that the advantages of the army training units for students have been fairly well distributed among public and private institutions. In view of the special inducement held out to men, it is not surprising that the attendance of women decreased, excepting in their own institutions which could provide them with special training for the war. One needs only to examine the reports of schools which did not apply for the army units to be convinced of the extent to which this movement was a factor in maintaining the colleges. Some institutions without this were almost stripped of college men and on the other hand a few of the institutions having the S. A. T. C., which under the tendency prevailing last year would have found it practically impossible to continue, are now able to go on with fair attendance.

PATRIOTIC SERVICE THROUGH THE SCHOOLS

The Government's School Policy.—If the public schools were to render effective patriotic service the first essential was to know just what the requirements of the Government were. In February, 1918, the U. S. Commissioner of Education called together representatives of all Government departments directly concerned in prosecuting the war. As a result of this conference a programme was issued entitled, "Government Policies Involving the Schools in War Time," which was sent out to the schools of the country over the signatures of the Secretary of War, Secretary of the Navy, Secretary of Agriculture, Secretary of Labor, Chairman of the U. S. Civil Service Commission, Secretary of the Interior, and Commissioner of Education.

This circular pointed out first of all that:

> The entire spirit of the Administration in Washington is, and has been from the beginning, that the war should in no way be used as an excuse for giving the children of the country any less education, in quantity or quality, than they otherwise would have had, but, on the contrary, that the schools should do everything possible to increase their efficiency, to the end that the children now in the schools may at the conclusion of their course be even better qualified than ever before to take up the duties and responsibilities of life. Both the present demands of the war emergency and the prospective demands of the necessary readjustments inevitably to follow emphasize the need of providing in full measure for the education of all the people.

In view of the tendency of boys under age to enlist in the Army and Navy and the boys and girls both to go into industry, the War and Navy Departments made clear that

> so far as the Army and Navy are concerned there is nothing more important that the schools can do than to keep going at full capacity, and at the same time to emphasize in every possible way their work in physical education. High school boys will render the best service of which they are capable by remaining in school until completion of a high school course.

The circular pointed out that there was nothing in the war emergency to justify curtailment in any respect of the sessions of elementary schools. It was urged that teachers and pupils be encouraged to find ways of performing in the schools some service having war value, such as activities connected with the Junior Red Cross, war-garden work, Boy Scouts, war thrift work, and the like. The all-year school was vigorously recommended, possible modifications of the high-school programme were suggested to make high-school boys available for work on the farms under proper supervision, and the coöperative half-time plan of school attendance and employment was urged for industrial communities.

Junior Red Cross.—The school children began to take an official part in the educational and relief work of the Red Cross when the junior membership was organized in September, 1917. By Jan. 1, 1918, the enrollment was 860,741 pupils, in 2,531 schools, under 563 chapter school committees. Following the drive for membership in February, the numbers grew until there are now over 8,000,000 pupils under more than 3,000 chapter school committees.

The Junior Red Cross has furnished quantities of relief supplies. In January quotas were issued from national headquarters for 256,000 garments for foreign refugees, to be ready by June 1. In March the boys of the junior membership were asked to help furnish the 40 or more convalescent houses to be erected in connection with base hospitals in the camps of the United States, and the manual-training schools that pledges themselves to make 4,546 pieces of furniture by June 1 exceeded or even doubled their quotas.

Since the signing of the armistice the Junior Red Cross has given special attention to health education in the schools, in coöperation with the National Tuberculosis Association, the Council of National Defense, and the U. S. Public Health Service. The plan of the Modern Health Crusaders is being carried out.

United States School Garden Army.—The U. S. School Garden Army was organized in March of 1918, growing out of the school and home garden work which had been inaugurated by the Bureau of Education in 1914. President Wilson set aside $50,000 from his national security and defense appropriation to promote the work for the first six months. He later appropriated $200,000 more to carry the work through another 10 months. Two main purposes promoted the planting of the Garden Army, (1) increased food production, and (2) training of school children in thrift, industry, service, patriotism, and responsibility.

The plan of organization of the School Garden Army involved:

1. A general director, who is responsible for organization, propaganda, and administration.
2. Regional directors, who are charged with the responsibility of writing instructions upon gardening that will enable supervisors and teachers to take a garden company successfully through a season, even though not expert gardeners. These instructions have been put out in leaflet form and sent from the central office to all who applied for them.
3. Assistant regional directors, who work under the regional director and whose duties are similar to those of the regional director, excepting that of writing garden leaflets.
4. Coöperation with the State Councils of Defense through a state representative appointed by them.

A summary of the work to date shows that 1,500,000 boys and girls enlisted in the U. S. School Garden Army in 1918; 60,000 acres of unproductive home and vacant lots were converted into productive land, thus releasing an equal acreage now used in truck gardening and relieving transportation congestion through home consumption of home-produced foodstuffs; 50,000 teachers have received instruction in gardening through the garden leaflets distributed by the Government; boards of education and other civic organizations have been influenced to give financial and moral support to the school- and home-garden movement and to pay extra salaries for supervision and teaching; hundreds of civic, commercial, and patriotic organizations have become interested in the movement and are giving it hearty support; and home and vacant-lot gardening in cities, towns, and villages has been dignified and made popular to a degree that practically insures it a prominent and permanent place in the school system of our country.

War Savings Stamps Campaign in the Schools.—Secretary of the Treasury McAdoo early in the war saw the possibilities for small individual savings as a help in financing the war, and asked well known bankers to help him devise a plan that would bring in money for the Government and at the same time teach permanently valuable lessons in thrift. The result was the issue of war-savings stamps and certificates. Special arrangements were made for schools whereby pupils were able to save for thrift stamps a penny at a time. In most states the war-savings campaigns were handled by the state and county school authorities. About three-fourths of the states used the plans suggested by the National Committee, or some approximation of them, the changes being usually such as were necessary to adapt the national plans to local conditions. In Massachusetts the plan took the form of the "Happy Jacks Thrift Clubs," which enrolled a hundred thousand pupils in a two months' campaign. Many of the states adopted special plans to make the war-savings campaign successful. Illinois had a roll of honor for each schoolroom forming a society. Iowa

broadened the scope of the war-savings societies to make them permanent community-center organizations, including every man, woman and child in the district, for the purpose of patriotic education. The war-savings societies serve as a means of coördinating the activities of a community in the various drives put on by county organizations, such as war-savings stamps, Liberty Loan, Red Cross and Army Y. M. C. A. campaigns and food and fuel conservation measures. The war-savings societies serve as active educational centers to prepare the minds of the people that they may intelligently and earnestly meet their obligation in all these matters on the basis of the pledge they have made upon becoming members of the war-savings society.

New York State boosted the organization of a "national war-savings army." Pittsburgh attempted to do the war-savings work through the existing Junior Red Cross units. North Carolina offered a bronze memorial tablet to the school saving the most *per capita* by the purchase of war-savings stamps during the year.

With the help of the school authorities lessons based on thrift stamps were distributed to schools throughout the United States, suggestions were made as to methods of working thrift material into instruction in arithmetic, history, and English composition.

Junior Four-Minute Men.—Following the highly successful "four-minute men" plan originated by William McCormick Blair (see I, *War Organization*), a method was devised of introducing into schools a system of "junior four-minute men," these being boys and girls in the schools who by competition with their fellow pupils in making four-minute speeches earn the right to a certificate as junior four-minute men of the class or school. War-saving stamps and Liberty bonds are two of the national drives that have been effectively advertised through the junior four-minute men. It was found that parents at home discuss in lively and intelligent fashion the subjects assigned to the pupils in four-minute men contests.

The plan was as follows: The four-minute men prepared and mailed bulletins on various topics to the schools approximately once a month. These bulletins were used by the teachers as text matter from which the pupils prepared four-minute speeches or essays (about 400 words). The best speeches were then delivered at a meeting of the entire school. A committee determined which of the speeches in each competition were the best, and a suitable certificate from the National Government designating the pupils as junior four-minute men for the topic were awarded to the winner. These certificates were mailed to the schools with the bulletins and were indorsed by the principals over to the winning pupils.

Food Conservation in the Schools.—Under the stimulus of the need for food conservation home-economics instruction in schools assumed a new importance. By the summer of 1918 it was possible to report that all home-economics instruction in normal schools and higher institutions was entirely on a war basis, and that important modifications had been made amounting in many instances to complete reconstruction.

Teachers variously report that they "have found it necessary to revise the whole course in home economics," that their "entire course has been centered about the war situation," that "conservation has become the keynote," that "all the work has been on a war basis," and that "economy has been our slogan." Reports indicate that every possible saving has been made in the preparation of foods in the classrooms, and that the use of substitutes and the principles involved have been demonstrated and practiced. The work of food preservation has been specially stressed, school-garden products have been utilized, and the instructions of the Food Administration have been followed as closely as possible. Especially gratifying is the statement that "more attention has been given to the study of body requirements than formerly." Special dietetics classes have been held for the students, for nurses, and for women near the schools. The important educational work of the Food Administration was extended to the elementary schools during the year. In response to a request of the National Education Association a special textbook on "Food Saving and Sharing" was prepared for sale at cost to schools.

AMERICANIZATION THROUGH EDUCATION

Illiteracy Among the Foreign-Born.—One of the most urgent problems that has received public attention since the beginning of the war is that of the Americanization of the foreign-born. The selective draft focused public attention on the fact that illiteracy among the people of the United States ran as high as seven per cent. and that a large proportion of this illiteracy was among the foreign-born. Figures compiled by the National Americanization Committee early in 1918 showed that there were in the United States 13 million persons of foreign birth and 33 million of direct foreign parentage. The nation suddenly realized that little had been done to transform this immense fraction of our population into American citizens; that thousands of men and women who had come to this country too late to partake of the advantages of the public schools had remained in ignorance of our language and our institutions.

The problem was a significant one from the immediate military viewpoint. There were thousands of men in the Army camps who could not speak the English language sufficiently to understand military orders. Anti-American propaganda was at work among the foreign-born, gaining its chief strength from the inability of the foreign-born to read the English language and understand American public sentiment. Difficulties among foreign-born employees in the war essential industries were being fomented. It was felt that the five million foreign-born whites who did not speak the English language constituted a potential handicap not only in the winning of the war, but in the period of reconstruction that was to follow. There was strong demand that this mistake once made should never be made again; that hereafter there should not be schools where English was never heard; that there should not be groups who received their ideas of American life solely through the medium of foreign-language newspapers; that there should never again be literally millions of our population allowed to grow up in complete ignorance of our language, institutions and laws. Thus the Americanization movement claimed a share of attention from the public that it had never claimed before.

A National Americanization Programme.—On Dec. 13, 1917, the Council of National Defense indorsed the Americanization programme of the Bureau of Education and announced a general national programme to be worked out through the State Councils of Defense and through subsidiary organizations throughout the country. Under this programme the several States were urged to pass legislation requiring the attendance of non-English-speaking and illiterate persons between 16 and 21 years of age at some school or other recognized agency under public supervision. They were urged to require communities with a substantial number of immigrants to establish evening schools for their education. Adequate appropriations were urged, and each state having a substantial population of foreign-born was urged to appoint supervisors of immigrant education to conduct the state programme. Emphasis was laid upon the necessity of training institutions for teachers of immigrants and upon the necessity of improving the equipment of teachers for this kind of work through the proper preliminary instruction. State councils and community councils were urged to promote factory classes, to increase library facilities, and to coördinate the varied activities of private and unofficial organizations and agencies.

Work of the States.—Before the end of the year 30 states had organized state committees on Americanization, six had appointed state directors of Americanization, and at least a dozen states were mapping out legislation to be enacted in the spring of 1919 to make Americanization an essential part of the educational programme of the United States. State boards of education have been especially active in the Americanization movement during the year. The supervisor of immigrant education of the New York Department of Education has organized teachers' training institutes, formulated plans for industrial plants, and prepared courses for instruction in English and civics. In Massachusetts the State Board of Education has organized a Division of University Extension under which activities have been stimulated in many communities and methods of teacher training developed. In California the Commission of Housing and Immigration, in conjunction with the State Department of Education, secured the passage of a Home Teacher Act providing for the bringing of the instruction in English and civics, personal hygiene, sanitation, and other appropriate subjects to the homes of the immigrants. Through the coöperation of the State Daughters of the American Revolution, the women's organizations of the state and other interested agencies, an experiment was conducted in San Francisco pursuant to the provisions of the act. Success has been marked and the plan is to extend the system of home instruction. The Commission has also published pamphlets and courses of instruction in English and civics.

Americanization in the Schools.—Great progress is noted in a large number of cities. Not only has the number of evening schools been increased in those communities already having such facilities for instruction, but the number of cities creating evening schools for the first time has very substantially increased. It is interesting to note, however, that while the opportunities for instruction have very largely increased, attendance has not been altogether satisfactory. Labor conditions, overtime work, and the pressure of war activities, coupled with anti-American propaganda, have very largely caused a decrease in the average attendance of immigrants at public evening schools. This has caused the cities to redouble their efforts in publicity and the advertising of facilities. Many have published attractive posters and distributed handbills announcing evening schools, the subjects of instruction, and the location and hours. Supervisors of immigrant education have been appointed in Rochester, Detroit, Cleveland, Los Angeles, and other large cities. In some assistant superintendents of schools have been charged with the responsibility for the immediate direction of evening schools, with particular emphasis upon the education of immigrants.

In Detroit an extraordinary campaign of publicity was carried on by the Board of Commerce in conjunction with the Board of Education. The result was to increase very substantially the number attending evening schools. The coöperation of industrial plants was secured in sending their employees to school.

Legislation.—Legislation upon the subject of Americanization has made some advance. In New York State the legislature at its last session passed three bills: one provided for the compulsory attendance of non-English-speaking and illiterate minors between the ages of 16 and 21 years at some public school, plant school, or recognized private school; a second provided for the compulsory maintenance of schools and classes in every community where 20 or more minors were affected by the preceding bill; and a third appropriated $20,000 for teacher training. In Arizona the governor made an attempt to secure the passage of similar legislation without success, but the legislature did pass a bill appropriating $20,000 to be expended in the nature of state aid for the establishment and maintenance of suitable facilities for immigrants. In Wisconsin the various acts relating to vocational education and part-time instruction were amended in such way as practically to require the attendance of non-English-speaking and illiterate persons upon some school as a preliminary to part-time instruction.

Private Work.—The work of private agencies and unofficial organizations has been extensive. The Carnegie Corporation has entered into the field of investigation of the methods of Americanization. The National Americanization Committee has continued its coöperative arrangements with the Bureau of Education and other agencies of the Federal Government. Pamphlets in foreign languages have been distributed by the Sons of the American Revolution, while other patriotic societies have distributed printed propaganda on the subject.

In April an Americanization conference was held at Washington, consisting of governors and their representatives from 22 states, together with a number of other state officers, officials of commercial and industrial organizations, officers of State and National Councils of Defense, educators and others. A committee composed of Governor Millikin of Maine, Governor Stewart of Montana, Governor Manning of South Carolina, Levy Mayor of Chicago, Harold T. Clark of Cleveland, President Gompers of the American Federation of Labor, and President Arthur S. Sommers of the New York Board of Education, took steps to have legislation introduced providing for a national programme of Americanization. Agitation for this and similar legislation was active toward the close of the year, and prospects appeared excellent for the passage of appropriate national legislation by Congress early in 1919.

HEALTH AND PHYSICAL EDUCATION

Revelations of the War.—The war made clear two facts in the field of health that are of the highest importance for education: (1) that there is among our people an enormous amount of unnecessary physical defect and physical inefficiency; and (2) that this defect and inefficiency could be reduced in large measure by sound methods of physical education and health supervision in the schools.

State Legislation for Physical Education.—Two more states enacted laws in 1918 providing for state-wide physical education. These were Delaware and Maryland. This makes a total of eight states, since 1915, the others being: Illinois, New York, New Jersey, Nevada, Rhode Island and California. In six other states—Massachusetts, Connecticut, Pennsylvania, Nebraska, Ohio, and Colorado—legislative attention was given to the matter, but without resulting legislation. In New Jersey and Massachusetts special commissions made exhaustive investigations and reports as the basis for legislative action. Though this legislation in all but two states was enacted prior to the current year, it did not become effective until this year, except in New York and Illinois, and in New York the law was amended in 1918 making its provisions finally effective for the school year 1918-19.

The most significant feature of this legislation is the broad and comprehensive interpretation of physical education given either in the statutes themselves or in the administrative programmes adapted by the state departments of education. In the New

York programme physical education is interpreted as covering:

> (1) Individual health examination and personal health instruction (medical inspection); (2) instruction concerning the care of the body and concerning the important facts of hygiene (recitations in hygiene); and (3) physical exercise as a health habit, including gymnastics, elementary marching, organized supervised play, recreation and athletics.

In the California statute the aims and purposes of the physical education are specified:

> (1) to develop organic vigor, provide neuro-muscular training, promote bodily and mental poise, correct postural defects, secure the more advanced forms of coördination, strength, and endurance, and to promote such desirable moral and social qualities as appreciation of the value of coöperation, self-subordination, and obedience to authority, and higher ideals, courage, and wholesome interest in truly recreational activities; (2) to promote a hygienic school and home life, secure scientific sanitation of school buildings, playgrounds, and athletic fields, and the equipment thereof.

The Rhode Island syllabus states that "physical education may be defined as including healthful, sanitary environment; medical inspection; instruction in physiology and hygiene; and exercise in the form of such motor activities as marching, gymnastics, dancing, supervised play and athletics." With the exception of the Nevada law, all of these state laws provide for compulsory physical education in all public schools.

The results of the first year under the new law in New Jersey are summarized by the state commissioner as follows:

> Physical training, systematically taught this year for the first time in many schools, will be more effective next year. It has already enlivened the schools, created new enthusiasms and contributed to the welfare of children and teachers. . . . The public needs to realize that money expended for health education, both rural and urban, is money better spent than for almost anything else. . . . We need not only better medical inspection, but also more school nurses, in country as well as in city. It can not be said with emphasis too great that physical training is preparedness. Its purpose is no other than to increase our man and woman power.

Voluntary Organizations in Health Work.—The war has given stimulus to many voluntary organizations seeking to improve the health of school children. The Child Health Organization is an outgrowth of a committee of the New York Academy of Medicine on war-time problems of childhood, formed primarily to study the problem of malnutrition among school children (see also XIV, *Child Welfare*). The following is the programme the Child Health Organization has set itself:

> To teach health habits to children and to secure adequate health examinations for all children in the public schools of the country; to consider the urgent problem of malnutrition among school children; to safeguard the health of children in industry; to awaken the public to the necessity of conserving the health of the school child as a basis of national security and stability; to promote or coöperate with other bodies in securing legislation for the attainment of these objects.

Sex Education.—The war has lifted the veil of false modesty from the question of social hygiene and sex education. Effective methods of instruction in the cantonments have been developed. The Commission on Training Camp Activities through its camp community service has done much to educate the public (see XIV, *Social Hygiene*). The state health departments and the U. S. Public Health Service have carried on effective educational propaganda. Religious and educational societies as well as medical societies are seriously grappling with the problems of sex education. The Federal Government has issued a pamphlet, "Keeping Fit," for high-school boys, giving simply and briefly the main factors in physical fitness, including sex. Requests have come for large numbers of copies, not only from high schools, but also from the Young Men's Christian Association, Boy Scouts, industrial firms, and many other sources.

Medical Inspection. — Medical inspection has suffered in most of the states through lack of physicians during the war. Progress has therefore been slow. North Carolina appears to be one exception. The revised law which went into effect at the beginning of the present school year requires that teachers shall make a preliminary examination of all pupils, and provides for detailed examination of all suspected children by the county medical officer or by a physician designated by the state health department. The report of the first year's work under the new law shows that "more than 3.000 teachers properly filled out the cards after careful preliminary examination of more than 150,000 children"; and that of this "number of children, 34,387, or nearly one-fourth, have been carefully examined by the school physician or a specially trained school nurse." The report further shows much successful follow-up work and the establishment of dental clinics. "The most gratifying feature of the year's work has been the uniformly satisfactory work of the teachers in completing the preliminary examination of the children."

VOCATIONAL EDUCATION

Vocational Training for the Army.—The vocational-education movement during the year has concerned itself chiefly with three problems—training of men to serve as skilled mechanics in the army, vocational rehabilitation and reëducation of returning soldiers, and establishment of new vocational schools throughout the United States.

Under the supervision of the Federal Board for Vocational Education war emergency training classes for drafted men have been organized in the public schools throughout the country. A series of war emergency training courses for Army occupations has been prepared, and these courses have been adopted extensively not only for classes organized under direct supervision of the Board, but also for classes organized by the War Department among men enlisted in the Army, and for classes conducted on a commercial basis under private civilian control. The preparation of these courses and the organization of training classes were undertaken at the request of the Signal Corps and the Quartermaster's Department under the War Department and the U. S. Shipping Board.

An arrangement was perfected late in October, 1917, with the approval of the Secretary of War, for the utilization of the educational facilities of the United States by the Federal Board in coöperation with the War Department for the purpose of training drafted men in various occupations prior to their reporting at the cantonments. By June, 1918, 12,000 men had been trained through the Federal Board and state authorities for vocational education and turned over to service—6,000 in mechanical lines, 5,000 in radio work for the Army, Navy, and mercantile marine, and 1,000 in clerical occupations for Quartermaster Corps work. The director of the Federal Board estimates that an additional 3,000 men have been trained by private agencies through the impetus given to the work by the Federal Board, using Federal Board courses of instruction. The Federal Board prepared and circulated nine bulletins containing war-emergency courses.

The task of training mechanics proved so large and so important that the War Department found it necessary to create its own agency for this purpose. On Feb. 6 there was established within the War Department a Committee on Education and Special Training, whose functions were

> to study the needs of the various branches of the service for skilled men and technicians; to determine how such needs shall be met, whether by selective draft, selective training in institutions, or otherwise; to secure the coöperation of the educational institutions of the country and to represent the War Department in its relations with such institutions; to administer such plan of special training in colleges and schools as may be adopted.

By Aug. 1 the Committee on Education and Special Training had under training over 50,000 conscripted men, with contracts in force providing for the training of 100,000 men during the year.

Training for the greatly enlarged shipping industry was another important war development during the year (see also XIV, *Vocational Education*).

Vocational Reëducation for the Returned Soldier.—In the light of the experience of the other nations in the war the United States early set about creating agencies for the physical rehabilitation and reëducation of disabled soldiers and sailors. The result was a complete system of educational reëducation available for the soldier whose disabilities interfered with his earning a living in his old occupation.

The preliminary work was done in the office of the Surgeon-General, U. S. Army, soon after America's entrance into the war. The subdivision of education in the Division of Physical Reconstruction was established in October, 1917, for the purpose of devising plans for providing educational facilities for disabled soldiers and sailors during the period of hospital treatment and convalescence. On May 20, 1918, Dr. James E. Russell, dean of Teachers' College, Columbia University, New York City, was appointed chief of the subdivision. The work undertaken has been conspicuously practical. The activities include, besides repair work of various kinds, basketry, typewriting, telegraphy, academic studies, agriculture and gardening, bookkeeping, freehand and mechanical drawing, auto repair, carpentry, cobbling, and other handicrafts. In all more than 100 different activities have been introduced into the hospitals. Sixteen general convalescent and reconstruction hospitals have been provided for, or one in each of the 16 military districts.

In June, 1918, Congress passed the Smith-Sears Act, providing for the vocational rehabilitation and return to civil life of disabled persons discharged from the military or naval forces of the United States. The Act delegates to the Federal Board for Vocational Education the responsibility of reëducating the disabled men in some useful employment after their discharge from the Army or Navy, and provides for a plan of coöperation between the Federal Board and the Surgeon-General's Office covering the work done in hospitals, in order that the men may have the advantage of a continuous and coördinated plan. It is provided that there shall be full and complete coöperation of the several Government offices concerned with the future welfare of men discharged from the Army and Navy, including the medical and surgical services of the War Department and the Navy Department, the Bureau of War Risk Insurance in the Treasury, and the labor exchanges in the Department of Labor, and the Federal Board. Each will render service in retraining and returning to civil employment men disabled in the war.

The Federal Board acts in an advisory capacity in providing vocational training for men during their convalescence in the military hospitals, before their discharge from the Army or Navy, and completes the training after discharge, acting as the civilian agency for rehabilitation and placement in industry. Particularly valuable have been the special circulars issued by the Federal Board, in coöperation with the Surgeon-General of the Army and the Bureau of Medicine and Surgery of the Navy, describing the opportunities in various fields open to disabled soldiers. Incidentally this type of pamphlet is highly significant as one of the first instances of direct vocational guidance by an agency of the Federal Government.

General Progress.—The rapid organization of the country for vocational education was described in the YEAR BOOK for 1917 (p. 744). The Federal Board for Vocational Education points out that this was responsible for numerous difficulties in 1918. Some of the states have been handicapped by lack of funds for administration; others have been handicapped by lack of funds for matching Federal funds; and in various other ways the programme for the promotion of vocational education in the states has been delayed until the state legislature met to remedy the shortcomings of the acceptance acts. The Board says:

> The movement for vocational education in general is progressing so rapidly that no complete account of the schemes that are being proposed and adopted can be given within a limited space. In addition to the passage by Congress of the Vocational Education Act, there is to be recorded the acceptance by practically every state of the provisions of this law. At the same time many state systems of vocational education were established. In the majority of cases these schemes are integral parts of the state public-school system, and are main-

tained to a large extent by state funds, and supervised by the state educational authorities. This year for the first time teacher-training systems in agriculture, home economics, and industry have been established. These systems are in most instances financed by the state alone, but in the instance of approved work Federal aid will be forthcoming. The meeting in this way of the most important problem of the preparation of teachers marks a long step in the right direction. Again, through state and Federal aid, many new vocational schools have been established in small communities which, without such assistance, would be unable to bear the financial burdens thus necessarily imposed.

It is next to impossible at the present time to define specifically the progress in vocational education. As the facilities in the state develop it will undoubtedly be possible to secure more detailed information and present more comprehensively the development of vocational education state by state. From now on vocational education is a matter to which the energies of both state and Federal Governments will be directed. Its establishment means much for the defense as well as the prosperity of the people of the country. It means an immediate extension of our secondary public-school system so as to furnish a more practical education for all. It means, furthermore, that this extension will be carefully planned and ordered. It means an end to haphazard extension of vocational education. It means that a programme can be agreed upon and can be developed progressively from year to year.

LIBRARIES

J. I. Wyer, Jr.

War Service of the American Library Association. — Like all war plans and activities, the war service of the American Library Association, undertaken in July, 1917, upon express invitation of the War Department's Commission on Training Camp activities (*A. Y. B.*, 1917, p. 752) grew by leaps and bounds during 1918. In this country there are separate library buildings in 45 large camps, each housing 30,000 or more volumes, and each serving as a central depot from which other thousands of books are placed in huts, hostess houses, barracks, officers' clubs, quarantine stations, mess halls and other like places. These agencies serve, when the camps are full, more than a million and a half men. In addition to these, 270 smaller camps and posts, 151 naval and 40 Marine Corps stations, 54 aviation fields and 60 S. A. T. C. units have been furnished with books. More than 1,600 branches and stations have been established in the huts, canteens, clubrooms and hostess houses of the other six organizations coöperating in war-welfare work and in other Army and Navy quarters; besides 164 hospitals and Red Cross Convalescent houses have been supplied with books and in most cases with sympathetic, expert, personal service. More than 300 vessels have been furnished with libraries, and a deck library has been provided for every transport plying between America and Europe.

To Jan. 1 3,854,729 volumes had been collected as gifts from the American people and placed in circulation, and 1,722,000 additional books, mainly technical, historical, sociological and military (for it has been necessary to buy very little fiction) had been bought. This is more books than the bound volumes contained in any single library in the world. More than 5,000,000 copies of the "Burleson one cent" periodicals given by the public through the Post Office Department, and by it regularly turned over to the American Library Association, have been distributed in the 47 large camps in this country and through every possible channel abroad. The Association maintains a library service in every ward of every military hospital. It has sent overseas 1,337,259 books, a number limited only by the fact that but 50 tons of books monthly could be taken over by the War Department. By General Pershing's order, books in France are carried free of postage in the Army post office system of the A. E. F. It maintains a central book collection and a public reading room in Paris. A continuing staff of nearly 300 persons has been employed in the 47 camp libraries in this country, at the headquarters of the Library War Service in Washington and in France, while more than 400 American librarians have in the past 15 months had some part in the conduct of this work.

Total expenditures to Dec. 31, 1918, were as follows:

Buildings and equipment	$366,337.70
Books	742,643.88
Service and subsistence	319,686.16
Supplies and general equipment	204,936.95
Travel	48,885.49
Freight	30,648.84
Miscellaneous	50,404.20
Total	$1,763,543.22

In addition to $1,750,000 raised by the Association in its first public appeal in September, 1917, the War Department approved its budget in the sum of $3,500,000 as part of the total sum raised in the United War Work Campaign of November, 1918. This sum will insure continuance of the work at home but more particularly and extensively in Europe during demobilization, including, as it will, a very large and highly specialized book service in connection with the War Department's educational programme for the 40 divisions that are to remain in France.

The Association has prepared short and attractive book lists on subjects patriotic, vocational, and on conservation and reconstruction for distribution in quantities in the camps and through libraries to the schools and homes of the country. It has through a sub-committee on "library research as war service" organized agencies and resources in aid of individuals, government offices and schools who are investigating scientific, economic, social and historical problems concerned with the prosecution of the war or the approaching peace.

Saratoga Springs Conference.—The fortieth annual meeting of the American Library Association was held at Saratoga Springs, N. Y., July 1-6. Owing to war conditions the attendance, about 600, was not more than one-half what would be expected at Saratoga, though it made up in representative attendance of professional leaders what it lacked in numbers. The emphasis of the general sessions was placed on war service and there were four round tables for camp librarians at which their problems were thoroughly discussed. The exhibits displayed were also devoted to war activities, such as camp libraries and the library's help in stimulating food conservation. The social features common to conferences were largely omitted with the exception of the library school dinners. The final session was held in Albany on July 6 in commemoration of the centenary of the New York State Library. Three hundred members attended an interesting historical programme.

The following officers were elected: president, William Warner Bishop, University of Michigan; vice-presidents, Charles Belden, Boston Public Library, and Burton E. Stevenson, Public Library, Chillicothe, Ohio; secretary, George B. Utley; members of the executive board, Linda A. Eastman, Cleveland Public Library, and Adam Strohm, Detroit Public Library.

Deaths and Appointments. — The library profession has lost by death during 1918: April 14, Edmund Mills Barton, librarian emeritus, American Antiquarian Society, Worcester, Mass., of which for 30 years he was the active librarian; Aug. 24, William Howard Brett, for 34 years librarian of the Cleveland Public Library, a past president of the American Library Association and at the time of his death a member of its War Service Committee. The *Library Journal* for November, 1918, and the *Open Shelf* for September-October, 1918, are memorial numbers to Mr. Brett; Dec. 8 Samuel Swett Green, for 38 years librarian of the Free Public Library of Worcester, Mass., and since 1909 librarian emeritus. He was president of the Library Association in 1891 and for years a member of the Massachusetts Free Library Commission. The most important appointments for the year were that of Carl B. Roden as librarian of the Chicago Public Library, and Linda A. Eastman as librarian of the Cleveland Public Library.

Gifts.—The American Library Association reports the following receipts for 1917:

From the Carnegie Corporation	$1,055,934
From other donors (not including gifts, approximating $1,750,000 for Library War Service)	3,876,559
Total	$4,932,493

In 1918 the Carnegie Corporation reports $50,500. In November, 1917, the trustees resolved "that no new applications for the erection of library buildings will be considered . . . while the war lasts."

XXXI. CHRONOLOGY AND NECROLOGY

AMERICAN CHRONOLOGY

JANUARY

1.—Pennsylvania Railroad tunnels into New York ordered opened to coal traffic.

Fire destroys $2,000,000 of property in Norfolk, Va.

2.—Reorganization of Bureau of Ordnance of War Department in four divisions headed by business executives announced.

Colonel E. M. House's report as head of the American mission to the Allied War Council published in summary.

4.—President presents to Congress recommendations for legislation on Government operation of railroads; Railroad Control bill introduced in both houses.

Bill to establish a Department of Munitions introduced in Senate by Senator Chamberlain.

Charles B. Henderson (Dem.) appointed to Senate from Nevada succeeding Francis G. Newlands.

6.—Railroad Administration orders demurrage rates doubled.

7.—Senate passes Oil and Coal Lands Leasing bill.

Supreme Court sustains constitutionality of Selective Draft Act.

Gen. George W. Goethals appointed Director of War Department Transportation and Supplies.

Earl Reading, Lord Chief Justice of England, appointed British High Commissioner and special Ambassador to the United States.

8.—President Wilson, addressing Congress, on America's war aims, specifies 14 essential conditions of peace.

Federal woman suffrage amendment favorably reported to House.

Federal prohibition amendment ratified by Mississippi.

9.—President Wilson announces support of Federal woman-suffrage amendment.

10.—House adopts Federal woman-suffrage amendment.

Secretary Baker defends War Department before Senate Military Affairs Committee.

11.—Federal prohibition amendment ratified by Virginia.

14.—President proclaims extension of licensing system of food control to many new commodities.

Federal prohibition amendment ratified by Kentucky.

American steamer *Texan* sunk in collision in mid-Atlantic.

16.—Fuel Administration orders suspension of manufacturing east of Mississippi River except of foodstuffs for five days Jan. 18–22 and on each succeeding Monday to March 25, and closing of offices, stores and places of amusement on each Monday from Jan. 21 to March 25.

17.—Senate adopts resolution urging suspension of order of Fuel Administration for five days.

American gunboat *Monacacy* fired on by Chinese above Yoochow; one sailor killed.

18.—President Wilson issues statement justifying order of the Fuel Administration.

Railroad Administration appoints Railroad Wage Commission and divides country into three operating districts.

19.—Senator Chamberlain (Ore.) declares in New York that military establishment has fallen down through inefficiency in every branch of the Government.

21.—President Wilson issues defense of War Department against Senator Chamberlain's charges of inefficiency; Chamberlain introduces bill for creation of a War Cabinet.

23.—Railroad Administration orders freight embargo excepting fuel, food and munitions on Philadelphia, Baltimore & Ohio and Reading railroads east of the Ohio River.

24.—Albert S. Burleson confirmed as Postmaster-General.

China apologizes for attack on U. S. Gunboat *Monocacy*.

25.—Edward R. Stettinius appointed Surveyor-General of Supplies in War Department.

26.—Food Administration issues regulations for conservation of wheat; President issues proclamation appealing for voluntary observance of two wheatless and porkless days and one meatless day per week.

Federal prohibition amendment ratified by North Dakota.

Fire destroys 4,500 ft. pier at Government shipyard at Port Newark, N. J.

Twelve killed by explosion of magazine at Newport Naval Torpedo Station.

27.—Organization of office of Director of Purchases in War Department announced.

28.—Secretary Baker defends administration of War Department before Senate Committee on Military Affairs.

31.—Joseph W. Folk resigns as chief counsel to the Interstate Commerce Commission.

FEBRUARY

2.—House passes Agricultural Appropriation bill.

Victor Berger; Adolph Germer, National Secretary of the Socialist Party, and three other Socialists indicted at Milwaukee for conspiracy to hinder prosecution of the war.

4.—President proclaims licensing of dealers in fuel oil.

5.—Secretary Baker announces appointment of Gen. Peyton C. March as acting Chief of Staff.

Franz von Rintelen and 10 associates convicted at New York of conspiracy to destroy Allied ships and sentenced to 18 months' imprisonment and fines of $2,000 each.

6.—Senator Overman introduces bill empowering President to coördinate and consolidate all government activities.

8.—Fuel Administration rescinds Monday closing order for eight southern states.

Fifty-five members of the I. W. W. indicted at Sacramento, Cal., for conspiracy against war measures.

9.—Earl Reading, British High Commissioner, arrives at New York.

10.—War Department orders reorganization of General Staff of the Army into five divisions.

11.—President Wilson addressing Congress declared German military party alone prevents peace and lays down four additional terms.

12.—House passes $50,000,000 Shipyard Housing bill.

Wm. J. Harris, chairman of the Federal Trade Commission, resigns.

13.—Fuel Administration rescinds Monday closing order.

Federal prohibition amendment ratified by Maryland.

Will H. Hays of Indiana elected chairman of Republican National Committee at St. Louis.

14.—President orders investigation of charges of irregularity and waste in Hog Island shipyard contracts.

15.—President proclaims control by War Trade Board of all import and export commerce.

17.—Strike of carpenters in New York and Baltimore shipyards ended by intervention of President Wilson.

18.—House passes $500,000,000 Urgent Deficiency Appropriation bill.

19.—Reciprocal conscription treaties between the United States and Great Britain and Canada signed at Washington.

21.—Agreement reached with Spain for supply of mules, food, etc., to American forces in France.

22.—Senate passes Railroad Control bill.

War Trade Board announces complete economic agreement between the United States and Norway.

23.—President proclaims $2.20 per bushel as minimum price for 1918 wheat crop.

David Baird (Rep.), of Camden, appointed Senator from New Jersey, succeeding Senator Hughes.

24.—War Department announces conviction by court-martial on Nov. 27, 1917, of Capt. David A. Henkes on charges of disloyalty and sentence to 25 years' imprisonment.

Red Cross liner *Florizel* wrecked near Cape Race with loss of 92 lives.

25.—Conference between representatives of capital and labor on war coöperation opened in Washington.

Wisconsin Senate adopts resolution condemning Senator La Follette for his attitude towards the war.

26.—Naval tug *Cherokee* founders off Maryland coast with loss of 29 lives.

27.—House passes Alien Slacker bill.

28.—House passes Railroad Control bill.

MARCH

1.—President signs $50,000,000 Emergency Fleet Corporation Housing bill.

California Supreme Court affirms conviction and death sentence of Thomas J. Mooney.

3.—Food Administration reduces restrictions on consumption of meat.

Prohibition except of manufacture of beer effective in Porto Rico.

4.—War Industries Board reorganized under chairmanship of Bernard M. Baruch.

U. S. naval collier *Cyclops* sails from Barbadoes and is not again heard from.

5.—John J. Delaney (7th District), Wm. E. Cleary (8th District), Jerome F. Donovan (21st District) and Anthony J. Griffin (22nd District), all Democrats, elected to House of Representatives from New York.

6.—House passes bill declaring strikes obstructing war industries to be conspiracies subject to penalty of 30 years' imprisonment.

Navy Department prohibits sale of liquor within five miles of any naval training station.

Wisconsin Assembly condemns attitude of Senator Robert M. LaFollette towards the war.

7.—Senate passes War Finance Corporation bill.

Commercial agreement between United States and Spain ratified at Madrid.

8.—House passes bill authorizing two additional Assistant Secretaries of War.

President signs Soldiers' and Sailors' Civil Rights bill.

David C. Coates elected chairman of National Party, in first convention at Chicago.

10.—Secretary of War Newton D. Baker arrives in France.

11.—Senate adopts amendment to Urgent Deficiency bill authorizing Alien Property Custodian to seize and dispose of all German-owned property.

President Wilson addresses to Russian National Congress of Soviets message of sympathy and pledge of aid to Russian people.

12.—Senate passes $1,180,265,355 Urgent Deficiency bill.

Federal prohibition amendment rejected by Rhode Island Senate.

15.—House passes the Daylight Saving bill.

Interstate Commerce Commission approves a 15 per cent. increase in commodity rates on railroads in eastern territory.

18.—Federal prohibition amendment ratified by Delaware.

19.—President signs Daylight Saving bill advancing time one hour from March 31 to Oct. 27.

Senatorial primary in Wisconsin results in nomination of Irvine L. Lenroot, Republican, Joseph E. Davies, Democrat, and Victor Berger, Socialist.

20.—President proclaims seizure of 40 Dutch ships in American waters.

Federal prohibition amendment rejected by New York Senate.

21.—Senate adopts amendment to Agricultural appropriation bill fixing minimum price of wheat at $2.50 a bushel; House passes War Finance Corporation bill.

President signs Railroad Control bill.

Scott Nearing and American Socialist Society indicted for sedition at New York.

22.—War Trade Board issues restrictive regulations for importation of non-essentials.

23.—Food Administration issues voluntary rationing measures for saving of wheat.

24.—American steamer *O. B. Jennings* and British steamer *War Knight* sunk in collision off English coast.

25.—Treasury Department announces amount of Third Liberty Loan as $3,000,000,000 at 4¼ per cent.

Karl Muck, conductor of the Boston Symphony Orchestra, arrested in Boston as an enemy alien.

28.—War Trade Board announces agreement with Japan releasing 100,000 tons of shipping to the United States.

29.—Senate passes bill extending Espionage Act to female enemy aliens, and bill extending draft to men reaching 21 since June 5, 1917.

Food Administration abolishes meatless day for 30 days.

President Wilson appeals to Governor of California for executive clemency for Thomas J. Mooney.

30.—House passes Third Liberty Loan bill.

War Labor Conference concludes agreement between capital and labor for peaceful adjustment of industrial disputes during the war.

Holland issues protest against seizure of Dutch ships by the United States.

31.—Time advanced one hour throughout the United States.

APRIL

1.—One hundred members of the I. W. W. charged with conspiracy to obstruct prosecution of the war brought to trial at Chicago.

2.—House passes $50,000,000 Emergency Housing bill.

Irvine L. Lenroot (Rep.) elected Senator from Wisconsin; John W. Rainey (Dem.) elected Representative from 4th District of Illinois.

Federal prohibition amendment ratified by Massachusetts.

4.—President signs Third Liberty Loan bill.

5.—Robert P. Prager, an enemy alien, lynched at Collinsville, Ill.

6.—President Wilson, speaking in Baltimore, declares no peace be made with Germany which gives her a free hand in the East; Secretary Daniels, speaking in Cleveland, declares that more than 150 American naval vessels are in the war zone.

Edward R. Stettinius and Frederick P. Keppel nominated as Assistant Secretaries of War.

Third Liberty Loan campaign opened.

9.—War Labor Board created.

10.—Senate passes Sedition bill.

Senate Committee on Military Affairs submits conflicting reports on aircraft production.

11.—President proclaims control of coastwise shipping by Railroad Administration.

13.—Germany through Switzerland demands release of Franz von Rintelen in exchange for Siegfried Paul London, an alleged American imprisoned at Warsaw, threatening reprisals if denied.

Sixty killed in fire in Oklahoma State Hospital for the Insane at Worman.

16.—Charles M. Schwab appointed Director-General of Emergency Fleet Corporation.

Secretary of War Baker returns to Washington.

17.—Railroad Administration takes over New York Barge Canal system.

18.—House rejects Senate amendment to Agricultural Appropriation bill fixing $2.50 as minimum price of wheat.

Senate passes Bullion bill authorizing melting of 350,000,000 silver dollars.

19.—House adopts amendment to Naval Appropriation bill increasing Marine Corps from 30,000 to 75,500.

President signs bill extending Espionage Act to female enemy aliens.

20.—House passes $1,312,000,000 Naval Appropriation bill.

President proclaims registration of female enemy aliens.

21.—Hemet and San Jacinto, Cal., wrecked by earthquake.

22.—House passes Bullion bill.

Walter Guion (Dem.) of Napoleonville appointed Senator from Louisiana, succeeding Senator Broussard.

23.—President signs Sabotage bill.

24.—John D. Ryan appointed Director of Aircraft Production, and Brig.-Gen. Wm. L. Kenly, Chief of Division of Military Aeronautics.

25.—House passes resolution extending draft to men reaching 21 since June 5, 1917.

Gutzon Borglum, in letter to *New York Times*, charges graft and profiteering in aircraft production.

American liner *St. Paul* sunk at pier in New York.

27.—Interstate Commerce Commission grants rate increases of five to 15 per cent. on class freight and increases in passenger rates on New England railroads.

29.—Senate passes Overman bill empowering President to coördinate executive bureaus as a war measure.

President nominates W. P. G. Harding, Allen B. Forbes, Eugene Meyer and Angus W. McLean as directors of War Finance Corporation.

X. P. Wilfley (Dem.) appointed U. S. Senator from Missouri.

30.—House passes Metals Control bill.

Franz Bopp, German consul-general, and E. H. von Schack, vice-consul, at San Francisco sentenced to two years' imprisonment and fines of $10,000 each for conspiracy against British rule in India.

MAY

1.—Senate passes Housing bill.

Prohibition effective in New Hampshire and Michigan.

Savannah liner *City of Athens* sunk in collision with French warship off Delaware coast; 67 lost.

3.—Commercial agreement between United States and Norway signed at Washington.

Major Gen. James W. McAndrew appointed Chief of Staff of the American Expeditionary Force.

4.—House passes Passport bill.

Third Liberty Loan campaign ends with total subscriptions of $4,170,000,000.

5.—Steel steamer *Tuckahoe*, 5,500 tons, launched by New York Shipbuilding Corporation at Camden, N. J., on 28th day after laying of keel.

6.—President Wilson directs Attorney-General to investigate charges of dishonesty in aircraft production and publishes correspondence with Gutzon Borglum.

U. S. Supreme Court upholds constitutionality of Selective Draft Act.

8.—Railroad Wage Commission recommends wage increases to railroad employees totaling $300,000,000 annually.

9.—Senator Chamberlain introduces resolution empowering Military Affairs Committee to investigate the conduct of the war.

14.—House passes bill empowering President to coördinate Government bureaus for war purposes.

President Wilson, in letter to Senator Martin, opposes pending resolution for investigation of the conduct of the war by the Military Affairs Committee.

War Trade Board announces extension of licensing of imports to include all commodities after May 27.

15.—President Wilson announces appointment of Charles E. Hughes as special investigator of aircraft production.

Airplane mail service between New York and Washington inaugurated.

New York State Barge Canal opened for through traffic from Hudson to Lake Ontario.

Steamer *Tuckahoe* delivered complete to Shipping Board on 37th day after laying of keel.

16.—Senate passes Post Office Appropriation bill.

18.—Two hundred killed by explosion in plant of Aetna Chemical Co., at Oakdale, Pa.

19.—Railroad Administration announces approval of capital expenditures of $939,000,000.

20.—Senate passes Rivers and Harbors Appropriation bill.

President signs Selective Draft bill affecting men reaching 21 since June 5, 1917.

President transfers to Bureau of Military Aeronautics and Bureau of Aircraft Production functions of Signal Corps pertaining to aircraft and aviation.

Gen. Peyton C. March nominated as Chief of General Staff of the Army.

U. S. Supreme Court denies suit of Government for dissolution of United Shoe Machinery Co.

21.—President signs Sedition bill.

Railroad Administration announces removal of all railroad presidents and reorganization of operation under Federal managers.

22.—Senate passes $1,615,000,000 Naval Appropriation bill.

Senate adopts compromise resolution empowering Military Affairs Committee to investigate any war activity.

23.—House passes Food Stimulation bill with clause making appropriation of $6,000,000 unavailable unless President prohibits manufacture of beer and wine.

War Department issues regulations to compel men of draft age to engage in useful work.

Federal prohibition amendment rejected by Louisiana Senate.

Rose Pastor Stokes convicted at Kansas City of violation of Espionage Act.

24.—Gen. Peyton C. March confirmed as Chief of the Army General Staff.

Federal prohibition amendment ratified by Arizona.

25.—President signs Hawaiian Prohibition bill.

26.—Railroad Administration orders wage increases to railroad employees aggregating $325,000,000 annually.

27.—President Wilson, addressing Congress, urges enactment of revenue legislation during current session.

House passes Urgent Deficiency bill with $60,000,000 appropriation for war housing.

Railroad Administration orders increase of passenger fares to three cents a mile on June 10 and of freight rates by 25 per cent. on June 25.

28.—Senate passes Urgent Deficiency bill.

Railroad Administration approves plan for consolidation of four leading express companies.

29.—President constitutes War Industries Board a separate administrative agency.

Commercial agreement concluded between Sweden and the United States and other Entente allies.

30.—Steamer *Agawam*, first fabricated steel ship of the Emergency Fleet Corporation, launched at Newark, N. J.

31.—House passes $12,000,000,000 Army Appropriation bill empowering President to increase army without limit.

JUNE

1.—Rose Pastor Stokes sentenced to 10 years' imprisonment in Missouri State Penitentiary.

U. S. destroyer *Ward* launched at Mare Island Navy Yard on 18th day after laying of keel.

3.—U. S. Supreme Court declares Federal Child Labor Act unconstitutional.

4.—United States denies German demand for release of Franz von Rintelen and warns against threatened reprisals.

5.—Senator Sheppard announces opposition of President Wilson and Mr. Hoover to prohibition amendment to Food Stimulation bill.

Registration of 745,000 men under amended Draft Act completed.

Resignation of Maurice Frances Egan, U. S. Minister to Denmark, announced.

6.—War Industries Board publishes agreement for control of distribution of all manufactured steel and iron products.

7.—President Wilson, addressing Mexican journalists, declares the sincere friendship of the United States for Mexico.

Jeremiah A. O'Leary, John T. Ryan and five others indicted at New York for conspiracy to commit treason and espionage.

10.—House passes Vocational Rehabilitation bill.

Passenger fares on all railroads advanced to three cents a mile.

12.—Senate rejects resolution of Senator Borah for open debate on treaties.

Railroad Administration creates three new operating regions west of Mississippi.

13.—Senate rejects a resolution to limit debate on a bill or resolution to 1½ hours for each Senator

Jeremiah O'Leary, indicted for conspiracy to commit treason and espionage, arrested at Sara, Wash.

17.—House passes $2,915,000,000 Sundry Civil Appropriation bill.

Western Union Telegraph Co. refuses request of President Wilson for suspension of its rule barring employees from membership in Commercial Telegraphers' Union.

19.—Senate passes $220,000,000 Pension bill.

21.—Seven members of the Russell sect sentenced at New York to 20 years' imprisonment for conspiracy to obstruct war activities.

22.—Eighty-five killed in collision of circus train on Michigan Central Railroad near Gary, Ind.

24.—House passes bill appropriating $5,435,096,224 for fortifications and heavy artillery.

Senate passes $3,000,000,000 Sundry Civil Appropriation bill.

Senate ratifies reciprocal conscription convention with Great Britain.

26.—Chemical section of the Bureau of Mines ordered transferred to Division of Gas Warfare in War Department.

Non-Partisan League carries entire Republican primary in North Dakota.

Federal prohibition amendment ratified by Georgia.

Prohibition effective in Texas.

27.—Resolution introduced in the House empowering the President to take over telegraph, telephone, cable and wireless systems for the duration of the war.

Prohibition amendment to Emergency Food bill approved by Senate Committee on agriculture.

Second draft lottery for 744,000 new registrants held in Washington.

28.—Senate rejects amendment to Army bill extending draft ages to 20 to 40 years

House passes $8,000,000,000 bond bill.

29.—Senate passes $12,089,000,000 Army bill, $5,500,000,000 Fortifications bill, and $3,000,000,000 Sundry Civil bill.

Post Office Appropriation bill vetoed by President because of appropriation continuing pneumatic mail tube systems, and amended bill passed by Senate and House.

Railroad Administration returns 1,700 short-line railroads to private management; both houses of Congress adopt reolution extending time for decision to Jan. 1, 1919.

Piers of German steamship lines at Hoboken taken over by President's proclamation.

State Department publishes and reaffirms note of April 2 to Mexico protesting against confiscatory tax on oil lands.

Federal Trade Commission's report charging profiteering on an enormous scale submitted to Senate.

Forty killed by collapse of a building in Sioux City, Iowa.

30.—Telegraphers order strike against Western Union for July 8.

Eugene V. Debs arrested in Cleveland for sedition.

JULY

1.—President vetoes Legislative, Executive and Judicial Appropriation bill because of a clause establishing an eight-hour day for Government employees; House repasses bill with clause eliminated.

President signs $1,573,468,415 Naval Appropriation bill.

Express companies combined for operation under American Railway Express Co.

Sugar certificates established by Food Administration.

State Department demands of Turkey an explanation of an attack on American consulate at Tabriz.

Sixty killed by trinitrotoluol explosion in the Semet-Solvay Co. plant at Split Rock, near Syracuse, N. Y.

2.—Senate passes General Deficiency Appropriation bill.

3.—House passes bill providing for Fourteenth Census in 1920.

War Department announces 160,400 officers and 2,010,000 men in Army.

4.—President Wilson, speaking at Mount Vernon, declares war cannot end with compromise and defines war aims of Allies.

Ninety-five merchant ships and 14 destroyers launched at American shipyards.

Cape May submarine station destroyed by fire.

5.—House adopts resolution empowering President to take over electrical communication systems.

Senate passes $8,000,000,000 bond bill.

Two hundred drowned by sinking of excursion steamer *Columbia* in Illinois River near Peoria, Ill.

6.—House passes Agricultural Appropriation bill.

Guam devastated by a typhoon.

Major John Purroy Mitchel killed by fall from airplane at Lake Charles, La.

7.—Christie Benet (Dem.) of Columbia, S. C., appointed to succeed Senator Tillman.

Telegraphers yield to appeal of Administration for postponement of strike against Western Union.

8.—Edward A. Rumely arrested in New York for perjury in concealing German ownership of the stock of the New York *Evening Mail*.

9.—American supply ship *Oosterdyjk* sunk in collision in mid-Atlantic.

One hundred killed in collision on Nashville, Chattanooga & St. Louis Ry. near Nashville, Tenn.

10.—Senate overrules chair on vote retaining prohibition amendment in Food Stimulation bill.

Fuel Administration announces plan to stop supply of coal to breweries within 10 months.

Mexico notified of lifting of embargo on exports of certain foodstuffs from the United States.

12.—President vetoes Agricultural Appropriation bill because of clause fixing minimum price of wheat at $2.40 a bushel.

13.—Senate passes Electrical Communications Control bill.

14.—President nominates ten persons competent to act as umpire in war labor disputes, Henry Ford heading the list.

15.—Senate agrees to recess to Aug. 24 and House to Aug. 19.

Contracts awarded for 30 merchant ships to be built in Japanese yards.

16.—President signs Electrical Communications Control bill.

23.—President proclaims Government control of Telegraph and Telephone systems under Postmaster-General Burleson from Aug. 1.

President proclaims Government operation of Cape Cod Canal.

26.—President Wilson issues statement denouncing mob spirit and action.

27.—Thomas J. Mooney reprieved by Governor of California to Dec. 13.

Two Germans arrested in act of igniting a bomb in a munitions plant at Irvington, N. J.

28.—Food Administration absolves public restaurants from pledges to use no wheat until after next harvest.

29.—State Department announces approval of proposed loan by American bankers to China.

30.—Ratifications of reciprocal conscription conventions between the United States and Great Britain and Canada exchanged at London.

31.—Fourth Liberty Loan campaign announced for Sept. 28 to Oct. 19.

President signs resolution revoking charter of National German-American Alliance.

AUGUST

1.—Senator New introduces bill for creation of a Department of Aeronautics.

Post Office assumes control of telephone and telegraph systems.

War Labor Board approves wage increases on 22 electric railway systems.

2.—Edward A. Rumely and S. Walter Kaufmann indicted at New York for perjury in concealing German ownership of the New York *Evening Mail*.

3.—President proclaims control by Shipping Board of charter rates for American vessels in any foreign service.

4.—Department of Justice announces agreement with International Harvester Co. for withdrawal of appeal and immediate dissolution.

Invincible, 12,000-ton cargo ship, launched at Alameda, Cal., in 24 working days.

5.—Bill making draft ages 18 to 45 introduced in both houses.

War Industries Board announces regulations reducing size of newspapers.

Hog Island shipyard launches first ship, the *Quistconck*.

8.—War Department orders consolidation of all branches of United States Army and abolition of separate insignia.

Federal prohibition amendment ratified by Louisiana.

9.—Paul M. Warburg retires from Federal Reserve Board.

Food Administration abolishes restrictions on use of meat.

11.—President Wilson issues appeal to coal operators and miners for increased production.

13.—President by proclamation prohibits foreigners from obtaining interest in American ships or shipyards.

15.—Senate reconvened for action on Man Power bill but lacks quorum.

16.—President proclaims requirement of special permit for departure of aliens after Sept. 15.

17.—One hundred members of the I. W. W. convicted at Chicago of conspiracy to obstruct prosecution of the war.

18.—American steamer *Proteus* sunk in collision off Virginia Capes.

19.—Senate and House reconvene.

20.—Senator James K. Vardaman (Dem.) of Mississippi defeated for renomination in primary on war record issue.

21.—Tyler, Minn., wrecked and 35 persons killed by tornado.

Roamer at Saratoga Springs lowers world's mile record to 1.34 4/5.

22.—Senate Military Affairs Committee publishes report of investigation of aircraft production charging incompetency, waste and profiteering.

Brigader-Gen. Peter C. Harris appointed Adjutant-General of the Army, succeeding Major-Gen. Henry P. McCain, transferred to field service.

24.—House passes Man Power bill.

Reciprocal draft convention between Italy and United States signed at Washington.

Convention extending for five years arbitration treaty with Japan signed at Washington.

Senate Republicans elect Senator Lodge as minority leader.

U. S. District Court at New York, in denying suit for damages against Cunard Co., declares sinking of *Lusitania* an act of piracy.

27.—Senate passes Man Power bill.

John D. Ryan appointed Second Assistant Secretary of War and designated Director of Air Service; Benedict C. Crowell, First Assistant Secretary, designated Director of Munitions.

Fuel Administration demands cessation of use of gasoline for pleasure on Sundays east of Mississippi.

Henry Ford nominated in Michigan Democratic Senatorial primary but defeated in Republican; Cole L. Blease defeated in South Carolina Democratic Senatorial primary.

Walter Hines Page, U. S. Ambassador to Great Britain, resigns.

Two Americans and several Mexicans killed in clash between troops on border at Nogales.

29.—Senate adopts amendment to Food Stimulation bill establishing prohibition after June 30, 1919.

Albert Rathbone nominated as Assistant Secretary of the Treasury.

30.—Reciprocal draft convention between United States and Greece signed at Washington.

William D. Haywood and 14 I. W. W. associates sentenced to 20 years' imprisonment and fines of $20,000 each; 80 other leaders sentenced to smaller terms.

31.—President Wilson signs Man Power bill and proclaims registration of men 18 to 21 and 32 to 45 on Sept. 12.

Machinists and toolmakers in Bridgeport, Conn., strike.

SEPTEMBER

2.—President proclaims minimum price of $2.20 per bushel for 1919 wheat crop.

3.—War Revenue bill reported to House.

Federal officials aided by soldiers, sailors and civilians begin search for draft evaders in New York and New Jersey.

4.—Alien Property Custodian seizes vessels of American Transatlantic Co. and Foreign Transport and Mercantile Corporation.

Four killed by bomb in Chicago Post Office.

5.—House passes Water Power Leasing bill.

Senate adopts resolution empowering President to establish prohibition zones of any size about war plants at his discretion.

Railroad Administration publishes contract offered to lines under Federal control.

6.—Senate passes Food Stimulation bill prescribing total prohibition from July 1, 1919.

United Fruit Company liner *Almirante* sunk in collision off New Jersey coast.

7.—George Brown Martin (Dem.) appointed Senator from Kentucky, succeeding Ollie M. James.

8.—Secretary of War Baker, Assistant Secretary John D. Ryan and Surgeon-General Gorgas arrive in France.

9.—House passes resolution empowering President to establish prohibition zones about war production plants.

Republicans carry Congressional and State elections in Maine.

11.—Senate passes Mineral Control bill.

William Hale Thompson defeated by Medill McCormick in Illinois Republican Senatorial primary.

12.—Men of 18 to 20 and 32 to 45 registered under Man Power Act throughout the United States.

Eugene V. Debs convicted at Cleveland of violation of the Espionage Act.

13.—House passes bill extending exemption of Liberty bonds from taxation.

President notifies striking machinists of Bridgeport, Conn., of penalties for refusal to accept award of War Labor Board; War Department announces commandeering of plant of Smith & Wesson Co. at Springfield, Mass., for refusal to accept labor award.

14.—Eugene V. Debs sentenced to 10 years' imprisonment.

15.—Committee on Public Information publishes documentary evidence of financing of Lenine and Trotzky by the German Government.

16.—President Wilson publishes reply to Austria-Hungary rejecting proposal for a conference of belligerents.

California Supreme Court denies application of Thomas J. Mooney for writ of error to the U. S. Supreme Court.

Vilhjalmur Stefansson arrives at Vancouver after five years of Arctic exploration.

17.—Twenty-five soldiers killed in collision on St. Louis & San Francisco Ry. near Marshfield, Mo.

Twelve killed in factory fire in Newark, N. J.

18.—Senate passes bill extending exemption of Liberty Bonds from taxation.

Commercial agreement between United States and Denmark completed at Washington.

War Department submits to Congress additional estimates for 1918-9 of $7,000,000,000 to provide for army of 4,800,000.

President proclaims closing of all breweries on Dec. 1.

State Department announces selection of John William Davis of West Virginia as Ambassador to Great Britain.

19.—Albert Strauss of New York nominated as member of the Federal Reserve Board.

20.—House passes $8,000,000,000 Revenue bill.

21.—Victor Murdock renominated as member of the Federal Trade Commission.

United States appeals to all allied and neutral Governments for immediate action in condemnation of Bolshevist terrorism in Russia.

23.—House adopts prohibition amendment to Food Stimulation bill.

Treasury Department announces terms of fourth Liberty Loan.

24.—Protocol extending for 10 years arbitration treaty between United States and Great Britain ratified at Washington.

27.—Five members of Philadelphia *Tageblatt* staff convicted of conspiracy to violate Espionage Act.

28.—Fourth Liberty Loan campaign opened.

30.—President Wilson, addressing Congress, urges adoption of Federal woman-suffrage amendment as a war measure.

Draft lottery for newly registered classes held in Washington.

OCTOBER

1.—Senate rejects Federal woman-suffrage amendment.

Submarine chaser sunk by steamer off New Jersey coast.

3.—Major-Gen. Merritte W. Ireland nominated Surgeon-General of the Army, and Brig.-Gen. Peter C. Harris as Adjutant-General; nomination of Major-Gen. William Crozier as Chief of Ordnance withdrawn.

4.—Shell-loading plant of T. A. Gillespie & Co. at Morgan, N. J., destroyed by explosions which wreck neighboring villages; scores killed.

11.—Earthquake and tidal wave cause much loss of life and property in Porto Rico.

12.—Hundreds killed and thousands rendered homeless by forest fires in northern Wisconsin and Minnesota.

18.—House passes $6,000,000,000 Military Deficiency bill.

19.—Fourth Liberty Loan campaign ends with total subscriptions of $6,989,047,000.

24.—Senate passes $6,000,000,000 Military Deficiency bill.

25.—President Wilson issues appeal to the nation for election of a Democratic Congress.

26.—Representatives of 11 oppressed nationalities of Central Europe adopt a declaration of independence in Independence Hall, Philadelphia.

31.—Department of Justice publishes Charles E. Hughes' report of investigation of aircraft production.

NOVEMBER

1.—Eighty-nine killed and 103 injured in wreck of an elevated-railway train in Brooklyn, New York.

2.—President Wilson signs order for seizure by the Government of all cables to foreign countries.

5.—Elections are held throughout the United States; Republicans carry both houses of Congress and a majority of the states; prohibition adopted in Ohio, Wyoming and Florida; woman suffrage adopted in Michigan and South Dakota.

7.—False report of signing of armistice issued by the United Press causes celebrations throughout the country.

11.—President Wilson reads the terms of the armistice to Congress, declares the war cannot be renewed, and suggests a charitable policy towards the people of Germany.

War Department cancels all army draft calls.

12.—War Industries Board and Fuel Administration issue modifications of restrictions on non-essential industries.

13.—A Pan-American labor conference opens at Laredo, Tex.

14.—Secretary McAdoo in a letter to Senator Simmons outlines the financial programme during the period of reconstruction.

Four killed by bursting of a steam valve on U. S. auxiliary cruiser *Louisville*.

15.—Government announces abolition of press censorship except on wireless messages.

16.—Post Office takes control of cables under President's order of Nov. 2.

Railroad Administration advances wages of railroad telegraphers 13 cents an hour.

Samuel Gompers declares that labor will fight to retain all wage and hours advantages gained during the war.

Herbert Hoover sails for Europe as chief food adviser of the Allies.

18.—President Wilson announces his intention to go abroad for conference on the main features of the peace treaty.

Senate passes Food Stimulation bill with clause making prohibition for the duration of the war effective from June 30, 1919.

U. S. Supreme Court refuses to review the case of Thomas J. Mooney.

20.—Post Office announces merger of all telegraph lines under Government operation.

United War Work Campaign ends with total subscriptions of $203,179,038.

21.—President signs Food Stimulation bill with prohibition clause.

John W. Davis confirmed as Ambassador to Great Britain and Alexander C. King of Georgia as Solicitor-General of the State Department.

The second session of the sixty-fifth Congress ends.

William G. McAdoo resigns as Secretary of the Treasury and Director-General of Railroads; John D. Ryan resigns as Assistant Secretary of War and Director of Aircraft Production.

Fuel Administration rescinds restrictions on use of electric signs and show windows.

26.—U. S. Shipping Board announces Government's decision to purchase fleet of the International Mercantile Marine Corporation at price offered by a British syndicate.

War Department orders demobilization of the Student's Army Training Corps.

27.—Secretary McAdoo forecasts a fifth popular bond campaign.

28.—Governor Stephens of California commutes the death sentence of Thomas J. Mooney to life imprisonment.

29.—President Wilson announces that the American representatives at the peace conference will be himself, Secretary Lansing, Henry White, Edward M. House, and Gen. Tasker H. Bliss.

30.—Bernard M. Baruch resigns as chairman of the War Industries Board.

DECEMBER

2.—Third session of the Sixty-fifth Congress opens; President Wilson in his annual message explains purpose of attendance at Peace Conference; Representative Mann resumes Republican leadership in the House.

Resolution introduced by Senator Cummins for appointment of a committee to represent the Senate in Paris during the Peace Conference; resolution introduced in the House by Mr. Rodenberg to declare the President's office vacant during his absence in Europe and to provide for the succession of Vice-President Marshall to the office as acting President.

First large unit of returned American troops arrives at New York.

3.—Resolution introduced by Senator Sherman to declare the President's office vacant.

Harry A. Garfield resigns as United States Fuel Administrator.

4.—President Wilson sails from New York for France.

Postmaster-General Burleson orders unified operation of the two ocean cable systems under Government control.

War Trade Board announces conclusion of a trade agreement with Holland.

5.—Carter Glass of Virginia nominated as Secretary of the Treasury.

Railroad Administration relinquishes control of steamship lines except those owned by railroads.

Fourteen killed in explosion at the du Pont Powder Co's plant at Pompton Lakes, N. J.

6.—Senate Finance Committee reports War Revenue bill estimated to produce a total revenue of $5,953,466,000.

Carter Glass confirmed as Secretary of the Treasury.

7.—President Wilson accepts resignation of Charles M. Schwab, Director-General of the Emergency Fleet Corporation.

9.—Ten men killed by coal-dust explosion on U. S. cruiser *Brooklyn* at Yokohama, Japan.

10.—War Revenue bill reported to the Senate.

Vice-President Marshall presides at a meeting of the Cabinet.

11.—Director-General McAdoo in a letter to Representative Sims recommends extension of Federal control of the railroads by five years to Jan. 1, 1924.

12.—Senate adopts resolution to suspend work on all Government housing projects not 75 per cent. completed.

13.—President Wilson lands at Brest.

Postmaster-General Burleson issues order excluding officials of the Commercial Cable Co. from control of their cable lines and placing Newcomb Carlton, president of the Western Union Telegraph Co., in charge of the entire unified cable system.

War Trade Board announces lifting of restrictions on exports to Allied countries on Dec. 16.

16.—Carter Glass sworn in as Secretary of the Treasury; Col. D. L. Lindsley appointed director of the Bureau of War Risk Insurance.

State Department announces lifting of restrictions on exports to European neutrals, except Switzerland.

President Wilson made a citizen of Paris.

18.—Senate adopts amendment to War Revenue bill taxing profits on products of child labor.

Five officials and editors of the Philadelphia *Tageblatt* sentenced to prison for violation of the Espionage Act.

19.—Senate adopts amendment to War Revenue bill repealing zone rates on second-class mail.

20.—Department of Justice publishes report of investigation of conditions at Hog Island shipyard.

21.—Senate adopts provision of War Revenue bill fixing maximum tax yield for 1920 at $4,000,000,000.

Major-Gen. Charles T. Menoher reported appointed Director of Air Service.

President Wilson granted honorary degree by University of Paris.

22.—Food Administration announces suspension of all food regulations.

23.—Senate passes War Revenue bill.

U. S. Supreme Court affirms property rights in news in decision for Associated Press against International News Service.

26.—Returned overseas battleship fleet reviewed at New York by Secretary Daniels.

28.—American transport *Tenadores* wrecked on Ile d'Yeu in the Bay of Biscay; no lives lost.

30.—Secretary Daniels advocates before the House Naval Affairs Committee a three year programme to cost $600,000,000 to make the U. S. Navy equal to the largest.

President Wilson receives the freedom of Manchester.

XXXI. CHRONOLOGY AND NECROLOGY

FOREIGN CHRONOLOGY

JANUARY

3.—Canadian men in first draft under Military Service Act called into service.

4.—Guatemala City completely destroyed by earthquake.

7.—German Social Democrats adopt resolution against veiled annexations by improper use of right of self-determination.

German submarine crews at Kiel mutiny.

8.—Australian Nationalist Government headed by Wm. M. Hughes resigns.

9.—British destroyer *Racoon* wrecked on Irish coast.

10.—Republic of the Don reported declared with General Kaledine as President.

British House of Lords rejects amendment against woman suffrage to Representation of the People bill.

13.—Constantine Diamandi, Rumanian Minister at Petrograd, arrested by Bolsheviki in retaliation for arrest of Bolshevist agitators in Rumania.

Joseph Caillaux arrested in Paris for treason.

14.—Bolshevist Government sends ultimatum to Rumania demanding release of Bolshevist agitators within 24 hours; Allied representatives at Petrograd present united demand for release of Rumanian Minister.

15.—Rumanian Minister at Petrograd released by Bolsheviki.

British Labor Party issues message to Russian people accepting principles of self-determination and no annexations or indemnities.

16.—U. S. Department publishes intercepted messages showing Joseph Caillaux's relations with Germany.

Premier Wekerle of Hungary and his Cabinet resign.

Bolshevist Premier Lenine orders arrest of King Ferdinand of Rumania.

Irkutsk and Orenburg, Siberia, reported captured by Bolsheviki.

17.—British House of Commons passes Man Power bill.

Switzerland recognizes independence of Finland.

18.—Russian Constitutional Assembly meets in Petrograd with Bolsheviki in minority.

19.—Bolshevist and extreme Social Revolutionary minority secedes from Russian Constitutional Assembly; Assembly adopts decrees awarding land to peasantry and providing for peace delegations to all belligerents; Bolsheviki dissolve Assembly by force.

21.—Austrian Cabinet resigns because of extensive peace strikes.

Sir Edward Carson, Minister without portfolio, resigns from British Cabinet.

22.—British Food Controller orders two meatless days a week in public eating places.

23.—Third Congress of Councils of Workmen's and Soldiers' Delegates opened in Petrograd.

24.—British House of Commons passes Man Power bill.

25.—Lord Rhondda, British Food Controller, appeals to United States for 75,000,000 bus. of wheat.

Extensive strikes begin in Germany.

26.—Bolsheviki capture Odessa.

27.—Hungarian Cabinet reorganized under Premier Wekerle.

29.—Lutsk reported captured from Bolsheviki by Ukrainians.

Premier Bratiano of Rumania reported resigned.

30.—Bolsheviki notify Persia of abrogation of Anglo-Russian agreement of 1907.

Russian Polish troops declare war on Bolsheviki; Bolsheviki occupy Kiev.

FEBRUARY

1.—Argentina recalls military attachés from Berlin and Vienna.

Orenburg reported captured by Bolsheviki.

3.—Bolsheviki decree separation of Russian Church from state and confiscation of all Church property.

4.—Canadian Government commission reports pilot and captain of French munitions ship *Mont Blanc* responsible for Halifax disaster.

Strikes in Germany ended under military coercion.

Court-martial of Paul Bolo Pacha opened at Paris.

5.—Polish troops occupy Mohilev and capture Ensign Krylenko and entire Bolshevist headquarters staff.

6.—Rumainan Cabinet resigns on receipt of German ultimatum demanding opening of peace negotiations.

British Parliament prorogued.

Uleaborg reported captured by Finnish Government troops.

8.—Austrian Cabinet headed by von Seidler resigns.

Leon Trotzky announces resignation as Russian Foreign Minister.

Bolsheviki reported heavily defeated by Ukrainians at Sarny.

British destroyer *Boxer* sunk in collision in English Channel.

10.—Baron Beaverbrook appointed Chancellor of the Duchy of Lancaster in the British Cabinet.

Smolensk reported captured by Polish troops.

Abdul Hamid II, deposed Sultan of Turkey, dies in Constantinople.

12.—Italian Parliament opened.

John Dillon elected chairman of Irish Nationalist Party, succeeding John Redmond.

13.—Presidential election in Colombia indecisive.

South African Assembly rejects woman-suffrage measure.

14.—Paul Bolo Pacha convicted by court-martial at Paris of treason and sentenced to death.

15.—Canadian Government announces decision to extend franchise to all women.

18.—Dutch Foreign Minister informs Parliament of threatened seizure of Dutch shipping in Allied ports.

19.—Mexico decrees regulations applying to oil lands amounting practically to confiscation of foreign interests.

Aland Islands reported occupied by Sweden.

23.—Petrograd placed under martial law.

24.—Parliamentary elections in Spain result in return of Liberals

25.—Compulsory rationing of meat, butter and margarine inaugurated in England.

Bolsheviki capture Rostov after battle with the troops of Kaledine and Korniloff.

26.—American sailors attacked by Sinn Feiners in streets of Cork.

Bolsheviki capture Novo Tcherkask, capital of the Don territory.

28.—Spanish Cabinet headed by Marquis de Alhucemas resigns.

Allied embassies to Russia arrive at Vologada.

MARCH

1.—Treaty of liquidation between Russia and Finland concluded at Petrograd.

2.—Rodriguez Alves elected President of Brazil.

7.—British House of Commons votes a war credit of $3,000,000,000.

9.—Spanish Cabinet headed by Marquis Alhucemas resigns.

10.—Spanish Cabinet headed by Marquis de Alhucemas withdraws its resignation.

11.—Bolsheviki remove seat of government to Moscow.

14.—Russian Council of Soviets meets at Moscow and ratifies treaty of Brest-Litovsk.

15.—Central American Court of Arbitration dissolved.

Sixteen killed by explosions of munitions works at La Courneuve, near Paris.

16.—Russian Congress of Soviets adjourns.

22.—Spanish Cabinet formed by Antonio Maura.

27.—British Government announces suspension of interest payments on Russian bonds after April 1.

Great Britain and France publish joint declaration that obligations of Imperial Russian Government are still existent and binding on any subsequent Russian Government.

28.—Anti-draft riots begun in Quebec.

APRIL

1.—Anti-draft riots in Quebec suppressed by the military.

7.—Bolo Pacha confesses his treasonable conspiracies and is reprieved.

9.—Lloyd George introduces bill in British House of Commons extending conscription to all men between 18 and 50 and announces extension of conscription to Ireland.

Leon Trotzky appointed Bolshevist Minister of War and Marine.

10.—Congress of oppressed nationalities of Austria-Hungry meets in Rome.

British House of Commons passes Man Power bill on second reading.

12.—British House of Commons passes Irish conscription clause of Man Power bill.

Food riots break out in The Hague.

13.—Honduras Congress approves treaty fixing boundary between Honduras and Salvador.

14.—Bessarabian Diet reported to have approved union with Rumania.

15.—Count Czernin, Austro-Hungarian Foreign Minister, resigns.

17.—Baron Burian appointed Foreign Minister of Austria-Hungary; Hungarian Cabinet headed by Dr. Wekerle resigns.

Bolo Pacha executed at Vincennes.

18.—King George signs British Man Power Act extending conscription to Ireland.

Viscount Milner succeeds Earl of Derby as Secretary for War in British Cabinet; J. Austen Chamberlain appointed to the War Cabinet.

20.—Government of Autonomous Siberia reported formed and aid asked of Allied nations.

22.—Budget of $14,000,000,000 introduced in British House of Commons.

Peruvian Cabinet reorganized.

23.—General Count von Mirbach, German Ambassador to Russia, arrives at Moscow.

24.—Viscount Motono resigns as Foreign Minister of Japan and is succeeded by Baron Gato.

25.—Baron Rothermere resigns as Secretary for Air Forces in British Cabinet.

26.—Baron Rhondda resigns as British Food Controller; Sir William Weir appointed Secretary for Air Forces.

28.—Sidonio Paes elected President of Portugal.

30.—British Government issues order-in-council deferring application of conscription to Ireland beyond May 1.

MAY

2.—Prussian Diet rejects amendment to Franchise Reform bill for abolition of plural voting.

3.—Persia notifies Holland that she regards as void all treaties affecting her sovereignty.

4.—Emperor Charles empowers Premier von Seidler to adjourn Austrian Parliament.

5.—Field Marshal Viscount French appointed Lord Lieutenant of Ireland, and Edward Shortt, Chief Secretary.

6.—Major-Gen. Sir Frederick B. Maurice, in letter to London *Daily Chronicle*, charges Lloyd George and Bonar Law with misstatements in House of Commons on military strength and recommends a Parliamentary inquiry.

7.—Asquith moves in British House of Commons for Parliamentary investigation of General Maurice's charges.

9.—Lloyd George defends Government against Maurice charges in House of Commons and is sustained by rejection of Asquith's motion for Parliamentary inquiry.

Sidonio Paes proclaimed President of Portugal.

10.—Roumanian Parliament dissolved and new elections ordered.

Alexander Wekerle forms a new Hungarian Cabinet.

11.—Major-Gen. Frederick B. Maurice retired by British Army Council.

Karimskaya, Siberia, reported captured by anti-Bolshevist forces of General Semenoff.

12.—Emperors of Germany and Austria-Hungary conclude preliminary agreement for closer military and economic alliance.

13.—British Government announces intention to denounce all commercial treaties.

German Emperor issues proclamation recognizing independence of Lithuania and assuming her participation in German war burdens.

14.—Prussian lower house rejects clause of Franchise Reform bill prohibiting plural voting.

Rumanian Government orders demobilization of army.

15.—M. Duval, director of the *Bonnet Rouge*, condemned to death for treason by court-martial at Paris.

17.—Sinn Fein leaders arrested in all parts of Ireland on discovery of a treasonable conspiracy with German agents.

New Portuguese Cabinet organized.

22.—Bohemia reported divided by decree of Austro-Hungarian Government into 12 district governments to advantage of Germans.

23.—Naval convention between China and Japan signed at Peking.

General Semenoff reported to have instituted a government in Siberia.

24.—Mexican Government announces suspension of diplomatic relations with Cuba.

25.—Finnish Cabinet resigns on appointment of Premier Zvinhufvud as Dictator.

28.—First Danish Rigsdag under equal-suffrage Constitution opened.

JUNE

2.—Military convention between China and Japan signed at Peking.

3.—Ciro Urriola becomes President of Panama on death of President Ramon Valdez.

11.—British Imperial War Cabinet meets in London.

14.—Peru seizes eight German ships interned at Callao.

16.—Bulgarian Cabinet headed by Radoslavoff resigns.

17.—Rumanian Parliament opened.

19.—Forty thousand armed Ukrainian peasants revolt in Kiev.

20.—British Government announces abandonment of Irish home-rule and conscription measures.

Strikes of munitions workers declared at Cologne and Mülheim.

21.—Austrian Cabinet headed by von Teidler resigns.

M. Volodarsky, Bolshevist commissioner, assassinated in Petrograd.

22.—M. Malinoff completes a new Bulgarian Cabinet.

28.—American troops assume police functions in Colon and Panama; Panaman Government protests to President Wilson.

Rumanian Chamber ratifies peace treaty with Central Powers.

30.—Vladivostok Soviet dissolved and city occupied by Czechoslovaks.

JULY

3.—German Reichstag ratifies peace treaty with Rumania.

General election in the Netherlands results in return of Conservatives.

Mohammed V, Sultan of Turkey, dies at Constantinople.

4.—Czechoslovaks form provisional government of Siberia at Vladivostok.

5.—Mohammed VI proclaimed Sultan of Turkey.

Prussian Diet passes Electoral Reform bill.

6.—Rumanian Senate ratifies peace treaty with Central Powers.

Count von Mirbach, German Ambassador to Russia, assassinated and rising of Social Revolutionists suppressed by Bolsheviki in Moscow.

7.—Russian Bolshevist army mobilized.

Urriola Government of Panama defeated in elections to National Assembly.

Chilean Cabinet resigns.

9.—Richard von Kühlmann, German Foreign Secretary, resigns.

Austro-German economic conference opened at Salzburg.

10.—Admiral von Hintze appointed Foreign Secretary of Germany.

Provisional Government of Siberia reported established at Novonikolayevsk.

12.—Japanese battleship *Kawachi* destroyed by explosion in Tokoyama Bay.

14.—General Horvath appoints War Cabinet for Siberia at Harbin.

16.—Austrian Reichsrat assembles.

Finnish Diet refuses necessary two-thirds majority on second reading of bill to establish a monarchy.

Louis J. Malvy, former Minister of the Interior, brought to trial for treason before French Senate.

17.—Nicholas II, deposed Emperor of Russia, executed at Ekaterinburg by Ural Regional Council.

M. Duval, manager of *Bonnet Rouge*, executed at Paris.

18.—Lord Robert Cecil appointed Assistant Foreign Secretary in British Cabinet and succeeded as Minister of Blockade by Sir Laming Worthington-Evans.

Hungarian Diet rejects woman-suffrage measure.

19.—British House of Commons passes bill excluding nationals of Central Powers from British citizenship for five years after the war.

Finnish Government withdraws bill to establish a monarchy and closes Landtag.

20.—Austrian Cabinet headed by von Seidler resign.

23.—Strike of munitions workers begins at Coventry, England.

24.—Karl Helfferich appointed German ambassador to Russia.

25.—Baron von Hussarek appointed Premier of Austria.

Allied diplomatic representatives in Russia leave Vologda for Archangel.

26.—Lloyd George threatens conscription of munitions strikers failing to return to work within three days.

Ukraine reported to have abandoned claim to Bessarabia and resumed diplomatic relations with Rumania.

Turkestan National Congress reported to have proclaimed a republic in alliance with Russia.

27.—Finnish crown reported accepted by Duke Adolph Friedrich of Mecklenburg-Schwerin.

28.—Allied embassies to Russia, refused domicile by the Archangel Soviet, leave for Kandalaska, Lapland.

29.—British munitions strikers in Coventry and Birmingham return to work.

30.—Field Marshal von Eichhorn, German commander in the Ukraine, and his aid assassinated in Kiev.

31.—Mexico modifies decree for confiscatory tax on oil lands of alien ownership.

AUGUST

1.—Peruvian Cabinet resigns.

2.—Government of the Russian Northern Territory instituted at Archangel.

Admiral von Holtzendorff, Chief of German Naval Staff, resigns.

3.—Cuban Congress empowers President to send military force to France.

6.—Louis J. Malvy, former minister of the Interior, convicted by French Senate of communication with the enemy and sentenced to five years' banishment.

7.—Marco Fidel Suarez inaugurated President of Colombia.

8.—Edward Shortt, Chief Secretary for Ireland, announces preparation of a new Irish Home Rule bill and determination to seize arms in Ulster.

9.—Bolsheviki arrest British and French consular agents at Moscow.

10.—M. Litvinoff, Bolshevist agent in London, placed under police supervision.

11.—Chinese Parliament opened.

12.—Mexico further modifies decree for taxation of oil lands of alien ownership.

China concludes with Japan contract for loan of 80,000,000 yen.

Bolshevist leaders Lenine and Trotzky reported fled from Moscow to Kronstadt; German Ambassador to Russia reported removed to Pskov; Allied consuls under arrest in Moscow reported released.

13.—Japan announces dispatch of troops to Siberia through Manchuria under agreement with China.

14.—Mexico in note to Great Britain denies right of foreign Governments to protest against confiscatory tax legislation affecting oil lands.

Food riots break out in Japan.

15.—Admiral Behncke succeeds Admiral von Capelle as German Minister of Marine.

Bolshevist troops reported evacuating Moscow.

17.—Japanese Government requisitions all stocks of rice for distribution.

19.—Strike of 14,000 transit workers begins in London.

25.—General Horvath reported to have attempted to assume dictatorship of anti-Bolshevist Russian forces in Siberia.

26.—Italian, Belgian and American consulates, except American Consul-General DeWitt C. Poole, leave Moscow for Petrograd.

27.—Three treaties supplementary to Brest-Litovsk signed at Berlin.

30.—Lenine seriously wounded in Moscow by attempted assassin, Dora Kaplan; Moses Uritzky, Bolshevist Commissary for Home Affairs, assasinated in Petrograd.

31.—Jonkheer Ruijs de Beerenbrouck appointed Premier of the Netherlands.

Bolshevist soldiers attack British Embassy in Petrograd and murder Capt. Francis Cromie, naval attaché

SEPTEMBER

1.—Duke Wilhelm of Urach reported selected as King of Lithuania.

3.—China negotiates loan of 30,000,000 yen with Taiheikumei Japanese Company secured by imports and exports monopoly.

4.—Great Britain demands of Bolsheviki immediate reparation for attack on Petrograd Embassy and murder of Captain Cromie and warns the Soviet Government that its members will be held individually responsible for lack of reparation or further outrages.

Dora Kaplan, assailant of Lenine, executed at Moscow.

6.—Hsu Shih Chang elected President of China.

7.—First instalment of war indemnity paid to Germany by Russia.

8.—Provisional Government at Archangel headed by Tschaikovsky overthrown.

12.—Tschaikovsky Government at Archangel restored at demand of Allies.

13.—Argentine Cabinet reorganized.

14.—Cotton spinners in Yorkshire and Lancashire strike.

19.—French Government publishes diplomatic documents forming basis of Franco-Russian alliance.

Food riots in Amsterdam suppressed by military.

21.—Japanese Cabinet headed by Count Terauchi resigns.

22.—Serious anti-German and peace demonstrations occur in Sofia, Bulgaria.

23.—German Social Democratic party declares for peace without annexations or indemnities, domestic democratic reconstruction, and a league of nations after the war.

25.—Strike of engine drivers in South Wales collapses on arrival of troops to take over railways.

Vladivostok declared under martial law.

Maxim Litvinoff, Bolshevist Ambassador at London, leaves England with his staff.

27.—German Imperial Chancellor von Hertling resigns; Vice-Admiral Edler von Mann reported appointed German Secretary of the Navy, succeeding Admiral von Capelle.

28.—Peace demonstrations occur in Berlin.

30.—German Foreign Minister von Hintze and Vice-Chancellor von Payer reported resigned.

Kei Hara, appointed Premier of Japan, completes a Cabinet.

OCTOBER

2.—Prussian Upper House passes modified Franchise Reform bill.

3.—Prince Maximilian of Baden reported appointed German Imperial Chancellor.

4.—King Ferdinand of Bulgaria abdicates in favor of Crown Prince Boris.

Talaat Bey, Grand Vizier of Turkey, resigns.

Philip Scheidemann, German Social Democrat leader, reported appointed a Secretary of State without portfolio.

Austrian Cabinet headed by Baron von Hussarek resigns.

5.—W. S. Solf, Colonial Secretary, appointed German Imperial Foreign Secretary, and Mathias Erzberger, Centrist leader, Secretary of State without portfolio.

Russia reported to have notified Turkey of abrogation of Turkish clauses of Treaty of Brest-Litovsk.

6.—German Imperial Chancellor Prince Maximilian, speaking in Reichstag, outlines constitutional changes and announces peace overtures to President Wilson on basis of his definitions of war aims.

7.—Coalition of the rival Governments in Siberia announced.

8.—Turkish Cabinet resigns.

Spanish Cabinet headed by Antonio Maura resigns.

11.—Emperor Charles of Austria-Hungary announces a plan for the formation of a Croat state.

12.—Belisario Porras inaugurated President of Panama.

16.—German Federal Council approves constitutional changes bringing declaration of war and making of treaties under control of Reichstag.

Hsu Shih-chang inaugurated President of China.

18.—Emperor Charles of Austria proclaims the reorganization of Austria in a confederate state.

Czechoslovak Provisional Government proclaims independence of the nation of Austria-Hungary.

Baron Burian, Premier of Austria, reported resigned.

19.—Count Karolyi introduces in Hungarian Diet a motion demanding complete separation of Hungary from Austria.

23.—British House of Commons passes a resolution approving admission of women.

24.—Karl Liebknecht, German Socialist leader, reported released from prison.

25.—Hungarian Cabinet headed by Wekerle reported resigned; Count Julius Andrassy reported appointed Austro-Hungarian Foreign Minister, and Count Albert Apponyi Premier of Hungary.

Canadian Pacific liner *Princess Sophia* founders off Alaska coast; 343, all on board, lost.

26.—German Reichstag passes bill putting the military authorities under control of the civil government.

Prussian Upper House passes the electoral reform bills.

27.—Riots in Budapest, following declaration of independence of Hungary by Count Karolyi, suppressed by troops.

28.—Emperor William issues a decree endorsing the German constitutional changes and pledging his coöperation in their full development.

29.—Czechoslovak Republic proclaimed in Prague.

Lord Beaverbrook resigns as British Minister of Information.

Joseph Caillaux brought to trial in French Senate on charges of treason.

30.—Revolutionists in Vienna and Budapest proclaim republics; Hungarian Diet declares independence of Croat states of Hungary and Austria.

NOVEMBER

1.—Count Stephen Tisza, former Premier of Hungary, assassinated in Budapest.

2.—King Boris of Bulgaria abdicates; a peasants' Government is established at Tirnova under M. Stambuliwsky.

Government of the Jugoslavs formally inaugurated at Agram; Czechoslovak leaders at Bohemia adopt a constitution.

3.—German naval revolutionists at Kiel form a Soldiers' Council which takes complete control of the town and fleet.

Hungarian National Council, released from oaths of fealty by the Emperor, proclaims a republic in Hungary.

4.—Chile seizes 84 interned German merchant ships in Chilean waters.

5.—German naval revolt extends to the entire fleet at Wilhelmshaven, Heligoland, Bockum and Cuxhaven.

6.—Germany breaks diplomatic relations with the Russian Bolsheviki because of the revolutionary propaganda of their representatives.

7.—German Socialist Party presents an ultimatum to the Chancellor demanding reforms and the abdication of the Kaiser and Crown Prince.

8.—German revolution extended to Hamburg, Bremen, Schwerin and Tilsit; naval revolutionists take the fleet out of Kiel.

Bavarian Diet deposes the Wittelsbach dynasty and proclaims a republic.

King Wilhelm II of Württemberg abdicates.

9.—German Imperial Chancellor Prince Maximilian announces decision of the Kaiser to abdicate and his own decision as regent to appoint Friedrich Ebert as Chancellor; Duke Ernest of Brunswick abdicates.

Revolutionary Workmen's and Soldiers' Council takes control in Berlin and proclaims a republic and a general strike; Friedrich Ebert assumes office as Chancellor.

Polish Republic reported formed at Cracow.

10.—The late German Emperor and the Crown Prince cross the Dutch frontier from Belgium; the ex-Kaiser, taking the name of Count William of Hohenzollern, takes up residence at Count von Bentinck's castle near Arnheim.

11.—Field Marshal von Hindenburg places himself and the German Army at the disposal of the People's Government at Berlin.

King Friedrich of Saxony and Grand Duke Friedrich of Oldenburg deposed; Grand Duke Friedrich of Mecklenburg-Schwerin abdicates.

12.—Emperor Charles of Austria-Hungary abdicates.

German Austria proclaimed by State Council a part of the German Republic.

Grand Duke William of Saxe-Weimar and Prince Leopold of Lippe-Detmold abdicate; republics are proclaimed in Württemberg and Hesse.

Lord Northcliffe resigns as Minister of Propaganda in the British Cabinet.

14.—A Socialist Cabinet headed by Friedrich Ebert organized in Berlin and proclaims sweeping reforms.

Prince Friedrich of Waldeck-Pyrmont and Duke Edward of Anhalt abdicate.

Anti-Jewish riots reported in Galicia and Poland.

15.—Brazilian Cabinet reorganized.

16.—A coalition Cabinet formed in Berlin under the Council of National Plenipotentiaries.

Deposed King Ludwig of Bavaria and Prince Adolf of Schaumburg-Lippe abdicate.

Czechoslovak republic proclaimed at Prague.

17.—Hungarian Republic proclaimed at Budapest.

Duke Charles of Saxe-Coburg, Grand Duke Friedrich of Mechlinburg-Schwerin, and Grand Duke Friedrich of Baden abdicate; a republic is proclaimed in Saxe-Meiningen.

Spanish Cabinet headed by Marquis de Alhucemas takes office.

18.—Adm. Alexander Kolchak made dictator by the Council of Ministers of the All-Russian Government at Omsk.

Prince Gunther of Schwarzburg-Rudolstadt abdicates.

20.—Central Soldiers' and Workmen's Council at Berlin dispute supreme authority of the six People's Commissioners headed by Friedrich Ebert.

Ukrainian Government reported overthrown and Kiev captured by anti-Bolshevist forces under General Denikine.

21.—British Parliament prorogued.

British steamer *Campania* reported sunk in collision in the Firth of Forth.

Hundreds killed by explosion of munitions trains at Hamont, Belgium.

22.—Spartacus group of radical German socialists defeated in attempt to seize the Berlin Police Presidency.

Philipp Scheidemann resigns as German Minister of Finance.

German Crown Prince interned at De Haukes, Wieringen Island.

Lord Robert Cecil resigns as Minister of War Trade in the British Cabinet.

23.—Anti-Peruvian riots occur at Iquique, Chile.

25.—Delegates from 21 German states meet in Berlin; Ebert, the People's Commissioner, declares the Government's intention to call a national convention.

Supreme power of the Central Soldiers' and Workmen's Council proclaimed at Berlin.

Rumanian Government issues a decree dissolving Parliament and convoking a Constituent Assembly elected by universal suffrage.

Peru withdraws her consuls from Chile.

28.—Bavaria breaks relations with the German Government at Berlin.

29.—Emperor William of Germany signs formal act of abdication.

Republic of Lithuania proclaimed at Riga with Karl Ullman as President.

DECEMBER

1.—German Crown Prince Friedrich William renounces his right to the crowns of Prussia and Germany.

King of Württemberg formally abdicates.

3.—Spanish Cabinet headed by Marquis de Alhucemas resigns.

4.—French Government announces denunciation of all commercial treaties containing most-favored-nation clauses.

5.—Count Alvaro de Romanones becomes Premier of Spain.

6.—Street fighting with 180 casualties occurs in Berlin between the Spartacides and Government troops.

7.—American envoys to Chile and Peru deliver identic notes urging a settlement of differences and offering mediation of the United States.

8.—Sweden severs diplomatic relations with Russian Bolshevist Government.

10.—Returned German troops welcomed in ceremonial entry into Berlin.

11.—Dr. W. S. Solf, German Foreign Minister, resigns.

13.—General Mannerheim elected President of Finland.

14.—A general election in the United Kingdom, the first under the enlarged suffrage, including women, results in the return of the coalition

Government headed by Lloyd George; Sinn Fein candidates almost universally successful in Ireland.

Sidonio Paes, President of Portugal, assassinated at Lisbon, and his assailant lynched; Tamagnini Barbosa assumes the Presidency.

Ukrainian republican troops enter Kiev.

British liner *Corinthian* wrecked on Northwest Ledge at mouth of Bay of Fundy.

15.—Hetman of the Ukraine abdicates.

16.—National Conference of German Soldiers' and Workmen's Councils opened in Berlin; rejects resolution to admit Liebknecht and Luxemburg as guests; elections to National Assembly in Anhalt result in victory of majority Socialists.

Poland severs diplomatic relations with Germany.

17.—Admiral Canto y Castro elected President of Portugal.

18.—German Congress of Soldiers' and Workmen's Councils adopt resolution to transfer legislative and executive power to the People's Commissioners headed by Ebert.

19.—German Congress of Soldiers' and Workmen's Councils fix elections to National Assembly for Jan. 19, 1919, and elect a new Central Executive Committee composed wholly of majority Socialists.

20.—German Congress of Soldiers' and Workmen's Councils adjourns.

21.—Heinrich von Eckhardt, German Minister to Mexico, recalled.

24.—Revolt of sailors in Berlin suppressed by troops loyal to the People's Commissioners.

Count von Brockdorff-Rantzau is appointed German Foreign Minister.

A new Portuguese Cabinet is formed with Tamagnini Barbosa as Premier.

25.—Turkish Parliament dissolved by proclamation of the Cabinet.

28.—Haase, Foreign Minister, Barth, Minister of Social Policy, and Dittman, Demobilization Minister, all Independent Socialists, resign from the German Cabinet when their recommendations are overruled by the Central Soldiers' and Workmen's Council.

29.—King Nicholas of Montenegro deposed by the Skupshtina, which declares for union with Serbia.

30.—Three Majority Socialists, Noske, Loebe and Wissel, appointed to the German Cabinet.

31.—Russian Bolsheviki capture Ufa and Sterlitamak, west of the Urals.

CHRONOLOGY OF THE EUROPEAN WAR

JANUARY

1.—Austrians retire across the Piave from bridgehead at Zenson.

2.—Leon Trotzky declares Bolshevist Government will reject German peace proposal; Bolshevist Central Committee issues appeal to enemy peoples.

4.—German Chancellor von Hertling announces denial of Russian proposals for transfer of peace conference to Stockholm and for evacuation of occupied territories prior to votes for self-determination.

British hospital ship *Rewa* sunk by submarine in Bristol Channel; three lost.

5.—Germans proclaim blockade of large areas about the Azores and Cape Verde Islands.

German Government announces temporary suspension of peace negotiations with Russia.

Lloyd George, speaking before British Trade Union Conference, restates British war aims, emphasizing restoration of Belgium, recession of Alsace-Lorraine, and independence of Poland.

6.—Armistice reported concluded in the Ukraine.

American steamer *Harry Luckenbach* sunk by submarine off French coast.

8.—President Wilson, addressing Congress on America's war aims, specifies 14 essential conditions of peace.

10.—Bolsheviki resume peace negotiations with the Central Powers at Brest-Litovsk; von Kühlmann withdraws German offer to negotiate a general peace on basis of no annexations or indemnities; Ukraine announces independent action.

Peace between Russia and Bulgaria reported concluded.

12.—Armistice between Russia and Central Powers extended one month; Bolsheviki waive demand for transfer of conference to Stockholm and recognize independence of Ukraine.

14.—Italians storm important positions on Monte Asolone.

Yarmouth bombarded by German warship; five killed.

20.—Turkish cruiser *Midullu* (formerly *Breslau*) sunk by mine and cruiser *Sultan Selim* (formerly *Goeben*) damaged by mine and beached in Dardanelles after sinking two British monitors in engagement off Imbros.

British escort vessel *Mechanician* sunk by submarine in English Channel.

21.—Thionville and Bernstorf raided by British airplanes.

General Borovich reported appointed to command Austro-Hungarian forces on entire Italian front.

23.—Belgium publishes reply to Pope Benedict's peace note demanding absolute political, economic and territorial independence.

French transport *La Drôme* sunk by mine off Marseilles.

24.—German Chancellor von Hertling speaking in Reichstag rejects peace programme of Allies as defined by Lloyd George and President Wilson; Count Czernin, Austro-Hungarian Foreign Minister, declares for opening of negotiations with United States on basis of President Wilson's programme.

Mannheim, Treves, Saarbrücken and Thionville bombarded by British airplanes.

28.—Italians on Asiago Plateau capture Col del Rosso and Col Dechele.

Bolsheviki sever diplomatic relations with Rumania.

London raided by German airplanes; 47 killed and 169 injured; one machine destroyed.

29.—Italians on Asiago Plateau capture Monte di Val Bella.

Allied Supreme War Council meets at Versailles.

30.—Paris raided by German airplanes; 20 killed and 50 injured.

FEBRUARY

2.—American troops reported in action on Lorraine front.

Allied Supreme War Council rejects speeches of von Hertling and Czernin as offering any basis of peace.

4.—British Prize Court condemns the steamers *Kankakee*, *Hocking* and *Genesee* of the American Transatlantic Co.

6.—Germany presents ultimatum to Rumania demanding opening of peace negotiations within four days.

British transport *Tuscania*, with 2,179 American troops on board, sunk by submarine off Irish coast, with loss of 208 officers and men.

9.—Peace treaty between Ukraine and Central Powers signed at Brest-Litovsk.

10.—Russian delegation at Brest-Litovsk, without signing peace treaty, declares state of war with Central Powers ended and orders demobilization of Russian forces on all fronts.

11.—President Wilson addressing Congress in reply to speeches of von Hertling and Czernin declares German military party alone prevents peace and lays down four additional essential terms.

12.—Lloyd George speaking in House of Commons rejects speeches of von Hertling and Czernin as offering basis of peace.

15.—Eight British patrol boats sunk by German destroyers in Dover Strait.

16.—London raided by German airplanes; 11 killed; German submarine bombards Dover.

Sir William Robertson, British Chief of Staff, resigns, and is succeeded by Sir Henry Wilson.

17.—London raided by German airplanes; 16 killed.

18.—Armistice between Russia and Germany ends; Germans resume hostilities on the whole front, occupying Dvinsk and Lutsk unopposed.

19.—Bolsheviki announce readiness to conclude formal peace on German terms.

20.—Germans in Russia occupy Rovno and report capture of 9,000 prisoners, 1,350 guns and immense stores; in Esthonia occupy Werder.

British in Mesopotamia occupy Khana Burayet.

21.—Bolsheviki call upon all Russians to rise in defense of the country and proclaim Petrograd in state of siege; Germans occupy Hapsal and Rieshitsa.

German troops reported landed in Finland at Vasa.

British capture Jericho (Eriha).

22.—Germans in Russia occupy Walk and Dubno.

23.—Germany offers peace to Russia on new and more rigorous conditions; Germans occupy Balbinovo and Borisoff.

24.—Bolsheviki announce acceptance of new German peace terms; Germans occupy Pernau and Dorpat.

German auxiliary cruiser *Wolf* arrives at Kiel after 15 months' cruise in Atlantic and Pacific and destruction of 35 vessels.

25.—German Chancellor von Hertling, speaking in Reichstag, approves the four principles of peace laid down by President Wilson on Feb. 11 if all Allies agree.

Germans in Russia occupy Reval and Pskov.

26.—Bolsheviki issue proclamation calling proletariat to defense of the revolution; Germany refuses request for armistice; Russians contest further advance; Germans in Ukraine capture Kolenkowitz.

British hospital ship *Glenart Castle* sunk by submarine in Bristol Channel with loss of 164 lives.

Trebizond reported captured by Turks.

27.—British Foreign Secretary Balfour, speaking in Commons, rejects von Hertling's speech as hypocritical in view of German policy in Russia.

28.—Germans in Russia reach the Dnieper; at Ryechitsa; Austro-Hungarians enter the Ukraine at request of Ukrainian Government.

MARCH

1.—Germans in Ukraine capture Gomel and Kiev.

British converted cruiser *Calgarian* sunk by submarine off Irish coast with loss of 48 lives.

French Government publishes instructions to German Ambassador at Paris dated July 31, 1914, demanding surrender of Verdun and Toul as guarantee in case of French neutrality in war between Germany and Russia.

2.—Peace treaty dictated by Germans signed by Bolsheviki at Brest-Litovsk.

Germans occupy Aland Islands as a base for operations in Finland.

Germans and Ukrainians recover Kiev from Bolsheviki.

3.—Germany suspends military operations in Russia.

Armistice between Germany and Rumania extended.

5.—Preliminary peace treaty between Germany and Rumania signed at Bucharest.

7.—Treaty between Germany and Finland establishing Finland's independence under German suzerainty signed at Berlin.

British in Palestine advance three miles on 18-mile front north of Jericho.

Two Russian transports sunk by German warships south of Aland Islands.

London raided by German airplanes; 11 killed and 46 injured.

8.—Paris raided by German airplanes; 13 killed and 50 injured; one machine destroyed.

9.—Peace treaty between Russia and Rumania concluded.

British in Mesopotamia occupy Hit and in Palestine advance three miles on a 13-mile front north of Jericho.

10.—War Department announces American troops in the trenches at four points, in Lorraine, Champagne and Alsace, and near the Chemin des Dames.

British in Palestine advance two miles on 12-mile front north of Jericho; Turkish garrison of Hit retires 22 miles to Khan-Baghdadi.

British airplanes raid Stuttgart.

11.—Americans in Toul sector make first raid without loss.

Paris raided by German airplanes; 29 killed and 50 injured, besides 66 killed by suffocation in a panic; four machines destroyed.

Bolsheviki reported to have invaded Persia.

12.—British in Palestine advance three miles on 11-mile front along coast.

13.—Germans occupy Odessa.

Germans reported landed at Abo, Finland.

Hartlepool raided by German airplanes; five killed; British airplanes raid Freiburg.

14.—Erzerum reported captured by the Turks.

Rumanians evacuate last of Austro-Hungarian territory.

17.—Kaiserslautern raided by British airplanes.

18.—Allies' Supreme War Council issues statement denouncing and repudiating peace treaties forced by Germany upon Russia and Rumania.

19.—German motor raider *Alexander Agassiz* captured by U. S. cruiser off Mazatlan, Mexico.

20.—Germans occupy Kherson, Ukraine.

British in Palestine capture Beit Rima and Kefrtut.

21.—Germans attack with slight gains on 50-mile front between the Oise at La Fère and the Sensée at Croiselles.

Two German destroyers and two torpedo boats sunk by Allied warships off Dunkirk.

Seventeen reported killed by explosion on U. S. destroyer *Manley* in collision with British warship in European waters.

22.—Germans advance on whole Arras-La Fère front, capturing Nonchy, Mory, Morchies, Hendicourt, Marquaix, Roisel, Vermand, and Vendeuil, and cross the Oise west of La Fère, taking in two days 25,000 prisoners and 300 guns.

British in Palestine cross the Jordan.

23.—Germans capture Péronne and Ham, increasing capture to 30,000 prisoners and 600 guns.

Paris bombarded by Germans at range of over 70 miles.

24.—Germans capture Bapaume, Nesle, Guiscard and Chauny and increase captures to 45,000 prisoners and 600 guns.

25.—Germans capture Miraumont, Biaches, Barleux, and Etalon; French evacuate Noyon.

Cologne raided by British airplanes.

American steamer *Chattahoochee* reported sunk by submarine off English coast.

British in Palestine occupy Essalt.

26.—Germans capture Albert, Lihons and Roye.

British in Mesopotamia capture entire Turkish force at Khan-Baghdadi, northwest of Hit, taking 5,000 prisoners and 10 guns.

27.—Germans capture Montdidier and Pierrepont; British recapture Morlancourt and Chipilly.

Lloyd George appeals for American reinforcements in shortest possible time.

Odessa reported recaptured by Bolshevist and Ukrainian troops.

28.—Germans extend attack northward on wide front east of Arras, taking Arleux, Fampoux and Boisleux; British abandon Chipilly; French advance a mile on six-mile front between Lassigny and Noyon and recapture Monchel.

General Pershing offers General Foch complete disposal of resources of American forces in France.

British armed boarding steamer *Tithonus* sunk by submarine.

29.—Germans capture Hamel, Marcelcave and Mezières, and claim total captures of 70,000 prisoners and 1,100 guns.

Seventy-five killed and 90 injured at Good Friday service in Paris Church struck by long-range German shell.

Russian cruiser *Admiral Makaroff* reported sunk by mine at Reval.

30.—Lloyd George announces appointment of Gen. Ferdinand Foch as Allied commander-in-chief on western front.

Germans capture Abercourt, Hangard-en-Santerre, Aubvillers and Cantigny, and capture and lose Demuin, Moreuil, Ayencourt and Montchel.

Germans occupy Poltava, Ukraine.

British in Palestine destroy several miles of Hedjaz Railway east of Jordan.

Ratifications of the treaty of Brest-Litovsk exchanged at Berlin.

31.—French recapture Hangard-en-Santerre.

French Government accepts offer of American troops for immediate service.

APRIL

2.—Count Czernin, speaking before the Vienna City Council, declares that only obstacle to peace disclosed in recent parleys initiated by France is the demand for recession of Alsace-Lorraine.

3.—German troops landed at Hango, Finland.

4.—Germans resuming offensive on a 16-mile front east of Amiens, from the Somme to Grivesnes, capture Morisel, Castel, Mailly, Raineval, and Hamel.

Erzerum reported recaptured from the Turks by the Armenians.

5.—French Government denies Count Czernin's statement that France sought peace negotiations with Austria-Hungary which were rendered abortive by demand for recession of Alsace-Lorraine.

Japanese and British marines landed at Vladivostok, following an attack by Russian soldiers on a Japanese.

6.—President Wilson, speaking at Baltimore, declares no peace will be made with Germany which gives her a free hand in the East.

Germans south of Oise penetrate Chauny and Coucy Wood; British recapture Aveluy Wood.

Ardahan, Armenia, reported captured by Turks.

7.—Germans south of Oise capture Pierremande, Folembray, and Verneuil.

8.—Germans cross Ailette between the Oise and Folembray and capture Quency and Landricourt.

Austro-Hungarian Government renews Count Czernin's statement that France initiated peace negotiations.

9.—Germans attack on 11-mile front from Armentières to La Bassée Canal; capture Richebourg-St. Vaast, Laventie; Neuve Chapelle, and Givenchy and take 6,000 prisoners; British recapture Givenchy with 750 prisoners; Germans south of Oise capture Coucy-le-Château.

British in Palestine capture El Kefr and Rafat.

10.—British evacuate Armentières; Germans cross Lys between Armentières and Estaires, and extending attack north to Ypres-Comines Canal, advance to Hollebeke, Wytschaete, Messines and Ploegsteert.

11.—French Government publishes letter of Emperor Charles of Austria-Hungary to Prince Sixtus de Bourbon recognizing France's claim to Alsace-Lorraine as a condition of peace.

Germans capture Estaires, Steenwerct and Merville.

American steamer *Lake Moor* sunk by submarine in European waters; 11 lives lost.

12.—Germans capture Ploegsteert Wood and Neuve Eglise and advance to Nieppe Wood.

Marshal Haig issues special order to British army that advance of Germans must be stopped.

Paris raided by German airplanes; 26 killed.

13.—British recapture Neuve Eglise; Germans capture Merris and Vieux Berquin.

Germans occupy Helsingfors.

14.—Germans again capture Neuve Eglise.

British and French troops reported landed at Mourmansk.

Batum captured by Turks.

15.—General Foch assumes supreme command of Allies on western front.

Germans capture Bailleul and Wulverghem.

16.—Germans capture Meteren, Wytschaete and most of Messines Ridge; British northeast of Ypres evacuate Langenmarck, Poelcappelle, Passchendaele and Passchendaele Ridge.

17.—American steamer *Florence H.* wrecked by internal explosion in French port; 41 lives lost.

18.—Germans repulsed in heavy attack from Givenchy to St. Venant; French advance on 2½-mile front astride the Avre.

19.—Italian troops reported at the front in France.

20.—Americans north of Toul lose and recapture Seicheprey; Germans take 183 prisoners.

21.—President of Guatemala announces decree of National Assembly of a state of war with Germany.

Van reported recaptured by Armenians.

23.—British and French naval forces raid Ostend and Zeebrugge; mole at Zeebrugge destroyed and two old cruisers sunk at mouth of canal; two old cruisers sunk in Ostend harbor; German destoyers sunk at Zeebrugge.

24.—Germans renew attack south of Somme, penetrate Hangard-en-Santerre and capture Villers-Bretonneux.

General von Eichhorn, German commander in the Ukraine, declares martial law in Kiev and arrests members of the Government during a session of the Rada.

Simferopol, Crimea, reported occupied by Germans.

25.—Germans capture Deanoutre, Kemmel, Mont Kemmel and Wytschaete, taking 6,000 prisoners, and south of the Somme recapture Hangard-en-Santerre; British recapture Villers-Bretonneux.

27.—Germans capture and lose Voormezeele, south of Ypres.

British in Mesopotamia capture Kifra.

28.—Kars reported occupied by Turks.

29.—Germans completely repulsed in attack on 15-mile front from Zillebeke to Meteren.

British in Mesopotamia capture Tuzhurmatli, taking 1,300 prisoners and five guns.

30.—Viborg reported captured by Finns.

British in Mesopotamia pursue retreating Turks to Tauk River.

MAY

1.—Germans occupy Sebastopol.

British in Palestine capture Es-Salt.

2.—American steamer *Tyler* sunk by submarine off French coast; 11 lost.

3.—Germans report complete defeat of Finns after five-day battle near Lakhti and Tavasthus and capture of 20,000 prisoners.

6.—Peace treaty between Rumania and Central Powers signed at Bucharest.

7.—Nicaragua declares war on Germany and her allies.

British in Mesopotamia occupy Kerkuk.

8.—American troops in France announced as exceeding 500,000.

9.—British cruiser *Vindictive*, filled with concrete, sunk in Ostend harbor entrance.

British completely reëstablish line north of Kemmel.

Italians storm Monte Corno.

1[illegible].—Arabs raid Hedjaz Railway near Jadi Jerdun.

Van, Armenia, reported occupied by Turks.

13.—American transport *Zaanland* sunk in collision.

14.—French north of Kemmel recapture Hill 44.

Austrian battleship sunk by Italian torpedo boat in Pola harbor.

American transport *Neches* sunk in collision in English Channel.

15.—British lay mine field 60 miles wide from Orkneys to Norwegian coast.

17.—Baku reported recaptured by Russians.

18.—British capture Ville-sur-Ancre.

19.—British hospital in France raided by German airplanes; hundreds killed and injured.

German airplanes raid London; 44 killed and 179 injured; five machines destroyed.

British in German East Africa occupy Nanungu.

21.—Americans take over a section of the Alsace front.

22.—Paris raided by German airplanes; one killed.

23.—British converted cruiser *Moldavia*, with American troops on board, sunk by submarine in English Channel; 53 Americans lost.

24.—Costa Rica declares war on the Central Powers.

25.—Two American schooners sunk by submarine off Delaware coast.

26.—Italians capture Presena, Monte Zigolon and Monticello Paso.

Czechoslovaks in Russia resist disarmament ordered by Soviet Government.

British transport *Leasowe Castle* sunk by submarine in Mediterranean; 101 lost.

27.—Germans, attacking on 40-mile front from Soissons to Rheims, cross Ailette between Vauxaillon and Craonne, storm Chemin des Dames, cross Aisne-Marne canal from Sapigneul to Brimont and advance to the Aisne between Vailly and Berry-au-Bac and at Cormicy, taking 15,000 prisoners; Germans in Flanders repulsed in attack on six-mile front between Voormezeele and Locre.

28.—American capture Cantigny.

Germans cross Aisne between Vailly and Berry-au-Bac, capture Terny-Sorny Ridge, Vregny, Missy, Braisne, Fismes, Villers-Franqueux and Courcy, and cross Vesle on either side of Fismes, increasing prisoners to 25,000.

29.—Germans capture Soissons, Juvigny and Crecy, and advance across Vesle to the line of Villemontoire, Coulonges, Brouillet, Branscourt and Thillois, increasing prisoners to 35,000.

German airplanes raid hospital containing American wounded.

Kirkuk, Mesopotamia, reported reoccupied by Turks.

30.—Germans capture Grand Rozoy, Fère-en-Tardenois and Vezilly and advance to the Marne; north of Soissons capture Bretigny, St. Paul and Trosly; west of Rheims capture Germigny, Gueux and Thillois.

Germans bombard Paris on Corpus Christi Day despite immunity of Cologne secured through Pope.

Greeks south of Struma advance on eight-mile front, taking Srka di Legen and 1,500 prisoners.

31.—Germans cross Oise east of Sempigny and advance north of Soissons to line of Blerancourt, Nouvron and Fontenoy; advance to the Marne from Château-Thierry to Dormans; capture Oulchy and advance astride Ourcq to Neuilly; and advance between Marne and Rheims to the line of Verneuil, Olizy, Sarcy and Champigny.

American transport *President Lincoln*, westbound, sunk by submarine in European waters; 27 lost.

JUNE

1.—Germans advance astride Ourcq to the line of Villers-Helon, Noroy, Priez, Monthiers and Etrepilly; southeast of Noyon advance to Carlepont Forest; Americans enter the line west of Château Thierry.

2.—Germans halted in drive astride Ourcq; capture Chaudun and Belin.

American steamers *Carolina*, *Texel* and *Winneconne* and four schooners sunk by submarines off Delaware coast; 12 lost from *Carolina*.

3.—Germans capture Pernant, Missy and Veuilly-la-Poterie; French and Americans rout small force which crossed Marne at Jaulgonne.

American tanker *Herbert L. Pratt* damaged by mine off Cape May.

4.—Norwegian steamer *Eibsvold* and an American schooner sunk by submarine off Virginia Capes.

5.—Supreme Allied War Council issues declaration for a united independent Polish state.

British steamer *Harpathian* and Norwegian steamer *Vinland* sunk by submarines off Virginia Capes.

6.—Americans and French gain a mile on 2½-mile front near Veuilly-la-Poterie and Bussiares, taking Vilny.

7.—Americans and French capture Torcy, Bouresches, and Veuilly-la-Poterie.

8.—American steamer *Pinar del Rio* sunk by submarine off Maryland coast.

Czechoslovaks occupy Omsk.

9.—Germans attacking on 20-mile front from Montdidier to Noyon, advance in center 2½ miles to the line of Rubescourt, Le Fetoy, Mortemer, Ressons-sur-Matz, Mareuil, Belval, Cannectancourt and Ville.

10.—Germans west of Noyon capture Belloy, St. Maur, Marqueglise and Elincourt; French east of the Oise withdraw to the line of Bailly, Tracy-le-Val and Nampcoel.

Austrian battleship *Szent Istvan* sunk by Italian torpedo boats off Cattaro.

Norwegian steamers *Vindeggen* and *Henrik Lund* sunk by submarines off Cape Charles.

11.—Americans south of Ourcq capture Belleau Wood.

French evacuate Dreslincourt, Ribecourt and entire angle between Matz and Oise; west of Matz recover Antheuil and Belloy.

12.—First American bombing air squadron to operate behind front attacks railway at Baroncourt.

Germans cross Matz and capture Melicocq; French north of Marne recover Montcourt.

Germans south of Aisne capture Cœuvres and St. Pierre Aigle; French west of Oise recapture heights of Croix Ricard and Melicocq.

Armistice concluded between Russia and the Ukraine.

14.—Turks report occupation of Tabriz, Persia.

Norwegian barks *Krinsjaa* and *Samoa* sunk by submarines off Virginia coast.

15.—Austrians begin offensive on 97-mile front from Asiago Plateau to Adriatic, cross Piave near Nervesa and Fagare, and advance along Brenta, taking 16,000 prisoners; Allies recover lost positions on Asiago and Monte Grappa fronts.

French south of Aisne recover Cœuvres.

16.—Austrians on lower Piave capture Capo Sile; Allies defeat all attacks elsewhere.

17.—Austrians diminish attacks in mountains and concentrate on Piave, increasing prisoners to 30,000 and advancing to the Fossalta Canal.

18.—Germans completely defeated in heavy attack on Rheims salient between Vrigny and La Pompelle.

Germany agrees at request of Bolsheviki to send two army corps against the Czechoslovaks in Siberia.

British transport *Dwinsk* sunk by torpedo 550 miles east of New York.

20.—Italians hold Austrians at all points against flooded Piave and recapture Capo Sile.

23.—Austrians begin disorderly retreat across flooded Piave.

State of war proclaimed in the Russian Province of Archangel.

24.—Italians clear entire right bank of Piave and advance at Monte Grappa.

Canadian hospital in France bombarded by German airplanes.

Von Kühlmann, German Foreign Secretary, speaking in the Reichstag, invites an Allied peace offer meeting Germany's vital needs but refuses any pledge in regard to Belgium.

25.—Americans storm important ridge south of Torcy, clearing Belleau Wood.

26.—Irkutsk, Siberia, reported captured by Czechoslovak troops.

27.—War Department announces an American regiment in France ordered to Italy.

Paris raided by airplanes; 11 killed and 14 injured.

Canadian hospital ship *Llandovery Castle* sunk by submarine off Irish coast with loss of 234 lives.

German troops cross the Finnish frontier into East Karelen and move on the Murman railway.

28.—British advance a mile on a 3½-mile front east of Nieppe Forest; French advance on a 3-mile front south of Ambleny, taking 1,000 prisoners.

29.—French in advance on two-mile front capture height between Moloy and Passy-en-Valois.

Italians capture Monte de Valbella with 800 prisoners.

30.—Italians capture Col del Rosso and Col de Chele with 1,200 prisoners.

French Government recognizes independence of the Czechoslovaks as a nation.

JULY

1.—Americans capture Vaux and Bois de la Roche, west of Château-Thierry, with 500 prisoners.

Gen. Otto von Below is appointed Commander-in-Chief and Marshal Arthur von Straussenburg Chief of Staff of the Austro-Germans on the Italian front.

Tiflis reported occupied by German troops.

American transport *Covington*, formerly Hamburg-American liner *Cincinnati*, westbound, sunk by submarine off French coast, with loss of six lives.

2.—French advance on a two-mile front north of Moulin-sous-Toutvent, taking 500 prisoners; capture St. Pierre Aigle, north of Villers-Cotterets.

Italians advance on the lower Piave and on Monte Grappa, taking 2,500 prisoners.

3.—French advance on three-mile front west of Autreches, taking 1,000 prisoners.

Delegation from Murman Coast invokes aid of British, French and American consuls at Archangel.

4.—British advance 1½ miles on a four-mile front, taking Hamel and Hamel and Vaire Woods and 1,500 prisoners.

5.—Coblenz and Saarbrücken raided by British airplanes.

Erivan, Transcaucasia, reported captured by Armenian forces.

Canadian troopship *City of Vienna* wrecked off Atlantic Coast.

6.—Italians complete reconquest of territory between new and old channels of Piave.

Italians and French in Albania begin operations between the coast and the Tomorica Valley.

British airplanes raid Coblenz, killing 12.

7.—British advance on a two-mile front astride the Somme.

Murman Regional Council ratifies agreement for military aid by Great Britain, France and United States.

8.—French advance on a two-mile front northwest of Longpont.

Italians advancing in Albania capture Fieri.

9.—French advance on 2½-mile front west of Antheuil, taking 500 prisoners.

Czechoslovaks in Siberia reported routed by Bolsheviki at Syzran and Buguima.

11.—German Chancellor von Hertling declares in Reichstag that Germany holds Belgium only as a pawn for peace negotiations, and announces readiness to receive serious peace proposals.

French capture Corcy, southwest of Soissons, and Longpont, east of Villers-Cotterets.

Italians in Albania occupy Berat.

American supply ship *Westover* sunk by submarine in European waters.

12.—French capture Castel in advance on three-mile front north of Cantigny.

13.—War Department announces 1,100,000 American troops overseas and three army corps organized in France.

French cross Savières River near Longpont.

French in Albania occupy Warta and Gramshi.

Irkutsk, Siberia, occupied by Czechoslovaks.

14.—Lord Robert Cecil announces an economic association of 24 Allied nations.

French in Albania capture three villages on east bank of Devoli.

Kem, on White Sea, reported occupied by British.

British and Germans conclude at the Hague an agreement for exchange of prisoners.

15.—Germans attack on 60-mile front from Château-Thierry to Massiges; attack east of Rheims fails completely; west of Rheims Germans gain three miles on 22-mile front, crossing the Marne between Dormans and Fossoy; Americans southwest of Jaulgonne in counterattack drive Germans across the river, taking 3,000 prisoners; Germans claim 13,000 prisoners.

American Red Cross hospital at Jouy bombed by airplanes; two killed.

French troopship *Djemnah* sunk by submarine in Mediterranean with loss of 442 lives.

British troopship *Barunga* with unfit Australians aboard sunk by submarine without casualties.

Klutshevsk, Siberia, and Kazan reported occupied by the Czechoslovaks.

Siberian Provisional Government appeals to Allies for joint military action.

Haiti declares war against Germany.

Baron Burian, Austro-Hungarian Foreign Minister, declares Central Powers ready to discuss as a basis of peace anything but territorial changes at their expense.

16.—Germans extend Marne crossing to Oeuilly, taking Chatillon and Mareuil; south of Dormans French recover St. Agnan, La Chapelle and Monthadon; east of Rheims Germans capture Prunay.

17.—Germans south of Marne penetrate Montvoisin and advance in Rheims Forest to a depth of 1½ miles on a 6-mile front.

Italian airplanes raid Pola.

Cunard liner *Carpathia* sunk by submarine off Irish coast, with loss of five lives.

18.—French and Americans, attacking from the Aisne to the Marne, advance three to six miles on whole 28-mile front from Fontenoy to Château-Thierry, taking 20 towns, 10,000 prisoners and 50 guns; French on Marne front recapture Montvoisin, Venteuil and Bois du Roi, and east of Rheims recover Prunay.

19.—French and Americans continue advance from the Crise to the Marne, cutting Soissons-Château-Thierry highway and increasing captures to 17,000 prisoners and 360 guns.

British capture Meteren, with 400 prisoners.

British seaplanes launched from warships raid Zeppelin sheds at Tondern, Schleswig; airplanes raid Mannheim, Heidelberg, Burbach and Oberndorf.

American armored cruiser *San Diego* sunk by mine off Fire Island with loss of six lives.

Honduras declares war against Germany.

20.—Germans retreat across Marne; French and Americans between Aisne and Marne increase captures to 20,000 prisoners and 400 guns; French southwest of Rheims capture Marfaux.

Italians in Albania capture Point Iozi, in the bend of the Devoli.

British transport *Justicia*, west bound, sunk by submarine off Irish coast, with loss of 11 lives.

21.—French and Americans occupy Château-Thierry after German retreat, cross Marne as far east as Mont St. Père, and advance at many points between Aisne and Marne.

Tug *Perth Amboy* and four barges sunk by submarine off Orleans, Mass., on Cape Cod.

22.—French and Americans advance in face of heavy German counterattacks between Ourcq and Marne, taking Epieds.

Fishing schooner sunk by German submarine off the Maine coast.

23.—French advance astride the Ourcq, taking Montgru, Oulchy-le-Ville, Le Plessier-Heleu, Rocourt and Châtelet Wood; French and British advance between Vrigny and Ardre River; Americans capture Buzancy, south of Soissons, and Jaulgonne, on the Marne; French north of Montdidier capture Mailly-Raineval, Sauvillers and Aubvillers, taking 1,850 prisoners.

British cruiser *Marmora* sunk by submarine.

Constantinople raided by Allied airplanes.

24.—French and Americans continue advance between Ourcq and Marne, taking Brecy, Courpoil and part of the Forest of Fère.

25.—French capture Oulchy-le-Chateau and Villemontoire; between Ourcq and Marne French and Americans advance two miles, taking Coincy, Charmel and Reuil; British advance 1½ miles west of Vrigny, taking Gueux and Mery-Premecy.

26.—French east of Rheims recapture Main de Massiges and restore entire front line.

Simbirsk reported captured by the Czechoslovaks.

27.—Germans north of Marne retreat on 24-mile front between Ourcq and Ardre; French and Americans in pursuit occupy Bruyères, Passy, La Neuville and Chaumuzy.

American troops arrive on Italian front; American troops overseas announced as 1,253,000.

28.—Germans continue retreat on whole Ourcq-Ardre front; French capture Fère-en-Tardenois and penetrate Ville-en-Tardenois; Americans cross Ourcq east of Fère and capture Seringes, Sergy and Ronchères.

29.—French north of Ourcq capture Grand Rozoy and Cugny.

Bolshevist Premier Lenine declares in Moscow Soviet existence of state of war between Russia and Entente powers.

30.—French and Americans advance east of Fère; French capture Romigny.

British south of Ypres capture Merris.

31.—Syzram reported captured by the Czechoslovaks.

AUGUST

1.—French and British north of Ourcq capture Beugneux, Cramoiselle and Cramaille; Americans capture Cierges and the Bois Meunière; French capture Romigny; prisoners in Allied offensive total 33,400.

Yekaterinburg reported captured by the Czechoslovaks.

Japanese steamer *Tokuyama Maru* sunk by submarine off Nova Scotian coast.

2.—Allies advance on whole Soissons-Rheims front, enter Soissons, cross the Crise along whole course, and capture Arcy, Coulonges, Goussaucourt, Ville-en-Tardenois, Gueux and Thillois; Germans west of Albert retreat across Ancre on a five-mile front.

Bolshevist authorities in Petrograd notify American vice-consul of existence of state of war between Russia and United States.

British schooner sunk by submarine in Bay of Fundy.

3.—Allies advance to Aisne and Vesle on whole Soissons-Fismes front; east of Fismes capture Branscourt, Courcelles and Champigny.

State Department announces plan approved by the Allies for economic and military assistance to Russia.

Archangel occupied by Allied troops after anti-Bolshevist revolution.

British troops landed at Vladivostok.

British hospital ship *Warilda* sunk by submarine in English Channel with loss of 123 lives.

American steamers *Lake Portage* and *Berwind* sunk by submarine off French coast.

Three American fishing schooners sunk by submarine off Yarmouth, N. S.

4.—Allies cross Aisne east of Soissons, capture Fismes, advance to Vesle east of Fismes, crossing at several points, and occupy La Neuvillette, north of Rheims; Germans north of Montdidier retreat across Avre on a ten-mile front.

American tanker *O. B. Jennings* sunk by submarine off Virginia coast.

5.—General Foch created a Marshal of France.

American, British and Japanese interests at Moscow assumed by Swedish consul-general; American consul warns Bolshevist Government of their personal responsibility for the safety of Allied prisoners.

German Zeppelins repulsed in attempted raid on English coast, one being destroyed at sea.

American tanker *Luz Blanca* sunk by submarine off Halifax.

American schooner *Stanley L. Seaman* sunk by submarine 110 miles off Cape Hatteras.

6.—Bolshevist Foreign Minister Tchitcherin notifies American consul of existence of a state of war between Russia and Great Britain and France but not the United States.

Diamond Shoals lightship off Cape Hatteras sunk by submarine.

American steamer *Merak* sunk by submarine off North Carolina coast.

7.—French and Americans cross Vesle in force between Braisne and Fismes; British advance on five-mile front between the Lawe and Clarence rivers, west of La Bassée.

War Department announces selection of Major Gen. Wm. S. Graves to command American force in Siberia.

8.—British and French east of Amiens attack on 25-mile front from Morlancourt to Braches, advance in center 7½ miles to Framerville, capture Morisel, Moreuil, Plessier, Beaucourt, Caix and Chipilly, with 14,000 prisoners and 100 guns.

Swedish steamer *Sydland* sunk by submarine 100 miles off Nantucket.

9.—Allies, extending attack south of Montdidier, capture Rubescourt, Assainvillers, Bouchoir, Arvillers, Rosières, Lihons, Rainecourt and Morlancourt, and increase captures 24,000 prisoners and 400 guns; Americans cross Vesle at Fismes and capture Fismette.

French troops landed at Vladivostok.

Italian airplanes drop manifestoes on Vienna.

10.—Allies capture Montdidier, Moreuil-Lamotte, Ressons, Conchy, Lignières, Fresnoy, and the heights of Boulogne-la-Grasse.

11.—Organization of first American field army announced.

Allies capture Macquivillers, Grivellers, Laberlière, Machemont-Armancourt, Tilloloy, and Cambronne, and increase captures to 36,000 prisoners and 500 guns.

German Zeppelin destroyed by British air and naval force off Dutch coast; six British motor boats lost.

British steamer *Penistone* and nine schooners sunk by submarine off Nantucket.

12.—Allies capture Proyart and Gury.

German Zeppelin destroyed by British airplanes off English coast.

Japanese troops reported landed at Vladivostok.

Norwegian steamer *Sommerstad* sunk by submarine off Fire Island.

13.—Great Britain recognizes Czechoslovaks as an allied nation.

French advancing between Matz and Oise capture heights of Lassigny.

American tanker *Frederick R. Kellogg* sunk by submarine off Barnegat; seven lost.

14.—French capture Ribécourt; Germans withdraw from advance positions on five-mile front between Beaumont-Hamel and Bucquoy.

American schooner *Dorothy Barrett* sunk by submarine off Cape May.

15.—British north of Roye capture Damery and Parvillers.

Paris raided by German airplanes.

Allied forces reported at Pabereshskaia, 100 miles south of Archangel, landed in Onega Bay, and operating on the Dvina; British force from Persia reported in Baku.

First American units arrive at Vladivostok.

16.—War Department announces raid behind German lines by 18 American-built airplanes driven by Liberty motors.

Allies west of Roye advance on eight-mile front between Fransart to Laucourt.

Darmstadt raided by British airplanes.

British forces from India reported in Turkestan.

American steamer *Montanan* sunk by submarine in European waters.

British tanker *Mirlo* and American schooner *Madrugada* sunk by submarine off Cape Hatteras.

17.—Americans in Lorraine capture Frapelle; French capture Canny-sur-Matz and advance on three-mile front on Antréches plateau.

French cruiser *Dupetit Thouars* reported sunk by submarine.

Norwegian steamer *San Jose*, off Nantucket, and bark *Nordhav*, off Virginia Capes, sunk by submarines.

American tanker *Joseph Cudahy* sunk by submarine off English coast; 13 lost.

18.—British west of Armentières advance on four-mile front between Bailleul and Vieux Berquin, taking Outtersteene; French advance on 10-mile front between Oise and Aisne, capturing Nampcel plateau and Nouvron-Vingre and taking 1,700 prisoners.

19.—French between Matz and Aisne capture Fresnières, Pimprez, Vassens, and Morsain, reach Lassigny and Dreslincourt, and clear Thiescourt Wood; British advance on six-mile front on the Lys and penetrate Merville.

20.—French advance three miles on 15-mile front between Oise and Aisne, capturing Beauvraignes, Lombray, Vezaponin and Courtil, and taking 8,000 prisoners; British continuing advance astride Lys occupy L'Epinette, Vierhoek, La Couronne and Le Touret.

Steam trawler *Triumph* captured by submarine off Portland and converted into armed raider.

21.—British advance three miles on 10-mile front north of Ancre, taking Moyenneville, Courcelles, Achiet-le-Petit and Beaucourt, with 3,000 prisoners; French west of Oise capture Lassigny, Plemont, Thiescourt and Ville, and reach the Divette; east of Oise capture Carlepont, Cuts, Camelin and Blerancourt, and reach Oise between Sempigny and Pontoise.

Spanish Government announces a warning to Germany that further losses of Spanish ships by submarine attack will be covered by seizure of German ships in Spanish ports.

22.—British advance two miles on six-mile front south of Ancre, taking Albert with 1,400 prisoners; French between Oise and Aisne capture Quierzy, St. Aubin, Epagny, Vauxrezis and Pommiers, and increase captures in three days to 200 guns.

Allies at Archangel in denial of false statements of Bolsheviki, avow to Russian people purpose to expel Germans from Russia and to suppress Brest-Litovsk treaty.

23.—British northwest of Bapaume capture Boiry, Gomiécourt, Ervillers and Achiet-le-Grand; south of Somme capture Herleville and Chuignes; French cross Divette at Evricourt.

Karlsruhe raided by British airplanes.

24.—British capture Bray, Thiepval, Contalmaison, Warlencourt, Sapignies, Miraumont and Cojeul, increasing prisoners to 17,000 in three days.

Allies in Siberia rout Bolshevist forces at Suiyagina, on the Ussuri River.

25.—British capture Mametz, Martinpuich, Le Sars and Le Barque.

Kazan reported recaptured by Czechoslovaks.

26.—British astride Scarpe penetrate Hindenburg line by capture of Wancourt and Monchy; capture also Cappy, Montauban and Bazentin-le-Grand; French capture Fresnoy and St. Mard.

27.—Allies advance on whole front from Arras to Noyon; British capture Roeux, Gavrelle, Cherisy, Vis-en-Artois, Bois du Sart, Fontaine-lez-Croisilles, Beugnatre, Longueval, and Vermandovillers; French capture Roye, Chaulnes, Cremery, Gruny, and Crapeaumesnil.

American submarine chaser No. 209 sunk by shell fire from transport *Felix Taussig* off Fire Island; 17 lives lost.

28.—French advance to Canal du Nord on whole front from Noyon to Nesle and to the Somme from Nesle to Cizancourt, cross Oise between Pontoise and Quierzy, and capture Pont l'Evêque and Mont Renaud; British capture Trones Wood, Croisilles Boiry and Pelves.

Japanese in Siberia occupy Krasnoyarski.

29.—British capture Bullecourt, Hendecourt, Remy, Bapaume, Braulencourt, Morval, Combles and Cléry, and cross Somme south and west of Péronne; French capture Noyon, Morlincourt, Landrimont, Quesnoy Wood, Guny and Pont St. Mard.

30.—British lose Bullecourt and Hendecourt but capture Hancourt, Eterpigny, Frémicourt, Vaux-Veancourt, Feuillaucourt and Mont St. Quentin, and reoccupy Bailleul, La Couture and Vieille Chapelle; French capture Mont St. Siméon, Chavigny, Cuffies, Champs, Catigny, Chevilly, Rouy and Leury, and cross Somme Canal east of Epénancourt; Americans capture Juvigny.

Japanese in Siberia capture Iman.

American steamer *Onega* sunk by submarine off English coast; 26 lost.

31.—British capture Riencourt and reoccupy Kemmel Hill and Doulieu; French capture Campagne and Crouy.

SEPTEMBER

1.—British capture Péronne, Bouchavesnes, Rancourt, Bullecourt, Hendecourt, Sailly-Saillisel and Riencourt, and pursue retreating Germans astride the Lys, taking Neuve Chapelle; French capture Crécy-au-Mont and cross Canal du Nord opposite Nesle; Americans enter lines in Belgium and capture Voormezeele.

Spain seizes a German steamship in retaliation for the sinking of the *Ataz-Mendi* by a German submarine.

2.—British penetrate Quéant-Drocourt switch line on six-mile front, capturing Dury, Cagnicourt, Villers-lez-Cagnicourt, Noreuil, and Quéant, and taking 10,000 prisoners; French capture Leuilly and Terny-Sorny.

3.—British advance on 20-mile front between Péronne and the Sensée, to the line of Ytres, Beaumetz, Baralle, Rumancourt and L'Ecluse, and south of Lys capture Richebourg-St. Vaast; French cross Somme before Epénancourt.

United States recognizes Czechoslovaks as a belligerent nation and the Czechoslovak National Council at Washington as a *defacto* belligerent government.

American transport *Lake Owens*, westbound, sunk by submarine off French coast.

4.—Germans begin retreat from Vesle, French and Americans advancing to the line of Chassemy, Brenelle, Vauberlin, Vauxcère and Blanzy, and crossing Vesle at Jonchery; French capture Libermont, Freniches, Mondescourt, Marizelle, Bucy-le-Long, Clamecy and Moncel; British cross Canal du Nord on wide front north of Moislains and capture Manancourt, Etricourt, Ruyaulcourt, and Mœuvres; British north of Lys capture Ploegsteert.

American steamer *Dora* sunk by submarine off French coast.

American forces overseas reported as 1,600,000.

Gen. Wm. S. Graves reported arrived at Vladivostok.

5.—Allies pursuing retreating Germans along the Canal du Nord, Ailette and Aisne recover 30 villages, including Falvy, Berlancourt, Pierremande, Coucy, Landricourt and Vregny, and reach the Aisne from Condé to Vieil-Arcy; British cross Somme south of Péronne, and French at Falvy.

American transport *Mount Vernon*, westbound, torpedoed without sinking off French coast; 35 killed.

Allies operating from Archangel occupy Obozerskaya.

Japanese in Siberia capture Khabarovsk.

6.—Allies advance on whole front from Bapaume to the Aisne, capturing Nurlu, Hancourt, Mouchy, Ham, Guiscard, Chauny, Tergnier and Barisis; Americans reach Aisne eastward to Villers-en-Prayères.

Transport *Persic* with 2,800 American troops on board beached on English coast after submarine attack without loss of life.

7.—Allies advance between Havrincourt and the Aisne, taking Roisel, Beauvois, Villévêque, Ste. Emilie, Aubigny, Dury, Tugny, Vaux, Avesne, Mennessis, Amigny-Rouy, and Celle-Aisne.

Japanese in Siberia capture Bolshevist naval base at Khaborovsk.

8.—French capture Fluquières, Happencourt and Hamel.

9.—British advance between Havrincourt Wood and Peizière, taking Gouzeaucourt Wood; French cross Crozat Canal at Liez, and capture Roupy, Serancourt, Clastres, Remigny, the fort of Liez, and Servais.

British transport *Missanabie* sunk by submarine off Irish coast.

Vologda reported captured by Russian anti-Bolshevist forces.

10.—French capture Gibercourt and Hinacourt.

Japanese in Siberia occupy Nerchinsk.

11.—British northwest of St. Quentin capture Vermand, Vendelles and Attilly, and cross the Canal du Nord north of Havrincourt.

American troops reported arrived at Archangel.

12.—Americans attack both sides of St. Mihiel salient on combined front of 20 miles, taking Fey-en-Hay, Thiaucourt, Vigneulles, Nonsard, Montsec, and Xivray on the south, and Combres, Dompierre and Dommartin on the north, and capturing 8,000 prisoners; French capture St. Mihiel.

British capture Havrincourt, Trescault and Mœuvres.

British steamer *Galway Castle* sunk by submarine off French coast; 189 lost.

13.—Americans eliminate St. Mihiel Salient, advancing to the line Norroy-Hattonville-Fresnes, and increasing captures to 13,300; British capture Bihecourt and Jeancourt.

14.—Austria-Hungary addresses note to all belligerents proposing a conference for preliminary and non-binding discussion of war aims.

French advance on 11-mile front between Ailette and Aisne, taking Mont des Singes, Allemont and Sanoy.

Allies begin advance along Dvina from Nijni-Kitsa, taking Zadboré and Shidpova.

Simbirsk reported captured by Bolsheviki.

15.—Serbians and French in Macedonia advance on 10-mile front west of Lake Doiran, taking Mounts Vetrenik, Dopropolie and Sokol.

Americans advance on whole front between Abancourt and the Moselle, taking Haumont and Doncourt; British capture Maissemy; French capture Vailly and Mont des Singes.

16.—President Wilson publishes reply to Austria-Hungary rejecting proposal for a conference of belligerents.

Allies in Macedonia capture heights of Truaviska, Rovovska, Brazdasta and Koziak, taking 4,000 prisoners and 50 guns.

Paris raided by German airplanes; six killed.

American steamer *Buena Ventura* sunk by submarine off Spanish coast; 25 lost.

British monitor sunk in harbor; 77 lost.

17.—Allies in Macedonia continue advance on whole front, taking Gradeschnitza, Stravina, Zovik and 40 other villages, and the heights of Polchichte, Bechichte and Topoles.

18.—British and French advance towards St. Quentin on 22-mile front, capturing Peizières, Epehy, Ronssoy, Hargicourt, Villeret, Pontru, Lempire, Fresnoy and Fontaine-les-Clercs, penetrating the Hindenburg Line at several points, holding all gains against heavy counterattacks, and taking 10,000 prisoners and 60 guns.

Allies in Macedonia capture Gydrov, Kamen and Cdazdrna, reach the Cerna, and cross the Belasnitsa; British and Greeks advance on 10-mile front on either side of Lake Doiran.

British in Palestine capture El Mugeir.

Perm reported captured by Czechoslovaks.

19.—British in Palestine, attacking from Jordan to the sea, rout Turks on whole front between Rafat and the coast and occupy in pursuit Tul Keram and Hudeira Lektera; Arabs east of Jordan cut railroads north, south and west of Derat.

Baku reported evacuated by the British.

French capture Contescourt, Castres, and Essigny-le-Grand; British recover Mœuvres.

Allies in Macedonia cross Cerna near Dunye.

Allies on the Dvina occupy Pless.

20.—British occupy Nazareth, El Afule and Beisan and envelop Turkish forces in central Palestine.

Allies in Macedonia advance nine miles to the line Krnyovo-Strigovo-Drogojel-Poloshko, taking Godiyak and nine other villages.

French capture Bemay.

Allies in Karelia occupy Ukhtinskaya.

Germany notifies Austria-Hungary of her readiness to participate in the proposed exchange of ideas; Austria-Hungarian Government declares offer remains open despite rejection by the Entente.

21.—British in Palestine, pursuing routed Turks, take 18,000 prisoners and 120 guns.

Allies in Macedonia capture Kavadar and reach Vardar near Negotin.

Allies on Dvina occupy Seltsko.

American forces overseas announced as 1,750,000.

22.—Allies in Macedonia advance on whole 90-mile front from Monastir to Doiran, cutting the Prilep-Gradsko and Uskub-Saloniki railroads and reaching the Vardar from Gradsko to Demir-kapu.

British in Palestine occupy Nabulus and seize last Jordan crossing open to Turks at Jisr-ed-Daneer, increasing captures to 25,000 prisoners and 260 guns.

French occupy Vendeuil and reach the Oise north of La Fère.

23.—Allies in Macedonia capture Prilep and advance north of Doiran to the line Bazarli-Furka-Smokvitsa.

British in Palestine capture Haifa, Acre and Es-Salt, Arabs occupy Ma'an.

Japanese in Siberia occupy Zeyzapristan.

Conference on war prisoners between United States and Germany opened at Berne.

24.—German Chancellor von Hertling, discussing the critical war situation in Reichstag, complains of neglect by Allies of his acquiescence in principle with the four peace conditions defined by President Wilson on Feb. 11.

Allies advance on seven-mile front west of St. Quentin, taking Pontruet, Francilly-Selency and Dallon.

Allies in Macedonia, advancing east of Vardar, occupy Gradsko, Enishoba, Karahodzali, Vonmashan, Krivolak and Ibirli.

Bulgarian Government headed by Premier Malinoff authorizes Commander in Chief to initiate negotiations for an armistice and terms of peace.

25.—British west of St. Quentin capture Selency.

Captures of British in Palestine reported to exceed 40,000 prisoners and 265 guns.

Allies in Macedonia capture Beli Kamen and Ishtib and invade Bulgaria opposite Kosturino.

Italian Government formally approves aspiration of Jugo-Slavs for an independent state.

26.—Americans and French, attacking on 40-mile front west of Meuse, advance four to seven miles, capturing Varennes, Montfaucon, Dannevoux, Cuisy, Mantillois, Montblainville, Tahure, Ripont, Rouvroy and Servon, and taking 13,000 prisoners and many guns.

British in Bulgaria capture Strumnitza; Serbians occupy Kochana, Veles and Ratavista.

Bulgarian envoy requests of Gen. Franchet d'Esperey, Allied commander in Macedonia, an armistice of 48 hours to permit of arrival of delegates of Bulgarian Government to arrange a permanent armistice and terms of peace; General d'Esperey declines to suspend hostilities but agrees to receive peace delegation.

British in Palestine reported in occupation of Tiberias, Semakh and Es-Samra, on the Lake of Tiberias, and Amman, east of Jordan; Arabs occupy Derat.

American cutter *Tampa* sunk by submarine off English coast; 118, all on board, lost.

27.—President Wilson, opening the Fourth Liberty Loan campaign in New York, declares that war must achieve a peace based on equal justice guaranteed by a League of Nations.

British, attacking on 14-mile front west of Cambrai, capture Beaucamp, Arleux-en-Gohelle, Sauchy, Epinoy, Haynecourt, Flesquières, Anneux, Graincourt, Bourlon and Bourlon Wood, cross Canal du Nord on a wide front, and take 10,000 prisoners and 200 guns.

Americans and French capture Charpentry, Véry, Epinonville, Ivoiry and Cernay, and increase prisoners to 18,000.

Allies in Macedonia, advancing between Lakes Ochrida and Presba, occupy Krushevo; Serbians capture Plachkovitsa range.

28.—Belgians and British, attacking on 10-mile front from Dixmude to Ypres, advance three miles to the line of Woumen, Schaep, Baillie and Broodseynde, taking Houthulst Forest and Poelcapelle with 4,000 prisoners.

Americans and French in Champagne penetrate Brieulles and Exermont and capture Somme-Py.

French south of Laon capture Fort Malmaison, Jouy, Aizy, Pinon, Vaudesson and Chavignon.

British in Palestine cross upper Jordan and form junction with Arabs at Derat.

Serbians capture Charevo and St. Nicholas.

Bulgarian peace delegation arrives at Saloniki.

British west of Cambrai capture Sancourt, Palleul, Raillencourt, Sailly, Gouzeaucourt, Marcoing, Noyelles, Cantaing and Fontaine-Notre Dame, and cross Scheldt Canal at Marcoing.

29.—Armistice based on unconditional surrender of Bulgaria signed at Saloniki.

Americans and French in Champagne capture Brieulles, Romagne, Exermont, Bouconville, Sechault, Ardeuil, Vieux and Ste. Marie-à-Py.

French south of Laon capture Pargny-Filain and Ostel and advance a mile astride the Chemin des Dames; French south of St. Quentin capture Urvillers and Cerizy.

British extend attack south to St. Quentin, cross Scheldt Canal on a wide front north of Bellenglise, and capture Bellenglise, Lehancourt, Magny la Fosse, Bellicourt, Nauroy, Villers-Guislain, La Vacquerie and Masnières.

Belgians capture Dixmude, Stadenberg, Paschendaele and Westroosebeke.

Turkish force of 10,000 men surrenders to British at Ziza, Palestine.

U. S. battleship *Minnesota* damaged by mine off Delaware Breakwater.

30.—Hostilities between Allies and Bulgaria suspended at noon; Allies occupy Uskub, Kumanovo, Kichevo and Dolenci.

Stephan Panaretoff, Bulgarian Minister, transmits appeal of Bulgaria for good offices of the United States in behalf of armistice negotiations.

French between Aisne and Vesle capture Revillon, Romain and Montigny-sur-Vesle and in the Argonne region, Aure, Binarville, Condé-lez-Autry and Monthois.

British on Cambrai-St. Quentin front capture Thorigny, Le Tronquoy, Gonnelieu, Vendhuille, Lavergies, and Proville and Tilloy, suburbs of Cambrai.

British and Belgians capture Amersweld, Oostnieuwkerke and Gheluwe, and reach the Lys from Warneton to Wervicq.

Allies on Dvina advance to point 375 miles southeast of Archangel.

American steamer *Ticonderoga* sunk in mid-Atlantic by submarine which shells lifeboats and attempts to drown all survivors; 213 lost.

OCTOBER

1.—French enter St. Quentin.

French between Aisne and Vesle capture Meurival, Ventelay, Bouvencourt, Pouillon, Thil, Trigny and St. Thierry, and in the Argonne region, Vaux-lez-Mauron; Americans in Argonne capture Cierges.

British on Cambrai-St. Quentin front capture Estrées, Joncourt, Crevecœur and Rumilly, and penetrate the Fonsommes-Beaurevoir line, taking Sequehart and Preselles.

British and Belgians capture Warneton, Sleskhake, Erquinghem and Ledeghem, and cross Lys between Wervicq and Comines.

British occupy Damascus, taking 7,000 prisoners.

2.—French complete capture of St. Quentin and occupy Moy; between Aisne and Vesle capture Roucy, Guyencourt, Bouffignereux, Villers-Franqueux Cauroy, Courcy and Loivre; and west of Argonne capture Challerange.

Americans east of Meuse occupy Pagny-sur-Moselle.

Germans begin retreat from Lens to Armentières; British occupy La Bassée, Douvrin and Aubers; British at Cambrai capture Neuville St. Remy; Germans recover Sequehart.

Italians in Albania begin advance between Adriatic and Osum, taking Fieri.

Allied naval squadron destroys Austrian naval base and warships at Durazzo.

3.—British occupy Lens, Armentières, Avion, Vendin, Hantay and Herlies; north of St. Quentin, attacking on eight-mile front from Sequehart to Bony, capture Sequehart, Ramicourt, Wiancourt, Montbreain, Gouy and Le Catelet, and cross Scheldt Canal at last two points, taking 5,000 prisoners.

British north of the Scarpe advance to the line of Vendin, Wingles, Berclau, Fournes and Houplines.

French north of Rheims capture Cormicy and reach Aisne Canal between Concevreux and La Neuvillette, taking 2,800 prisoners.

Austro-Hungarian War Office announces evacuation of Albania and occupation of Berat by Italians.

4.—Americans break the German Kriemhilde Line from Binarville to the Meuse, taking Jesenes, Fléville, Chenery and La Farge.

Americans west of Meuse capture Exermont and Romagne.

American steamer *San Saba* sunk by mine off Barnegat.

5.—Austria-Hungary appeals to President Wilson for an armistice and peace negotiations based on the points defined in his various speeches.

Germans retreat from the Vesle and about Rheims on a 28-mile front; French capture Fort Brimont, Moronvillers, Oranivilie, Bourgogne, Pontfagerger, and Cernay, and cross Suippe at Orainville, the Arnes at several points, and the Aisne Canal near Sapigneul.

British north of St. Quentin capture Montbrehain, Beaurevoir and Aubencheul-aux-Bois.

British cross Scheldt Canal on eight-mile front between Crévecœur and Le Cateletand, capture La Terriere.

British in Syria occupy Zahleh and Rayak.

Japanese steamer *Hirano Maru* sunk by submarine off Irish coast; 300 lost.

6.—Germany appeals to President Wilson for an armistice and peace negotiations based on his definitions of war aims.

French capture massif of Nogane l'Abbesse, Remaucourt, Betricourt, and Pont Givart, and St. Masmes, and complete the deliverance of Rheims.

British west of Douai capture Fresnoy.

American transport *Otranto* wrecked on Islay Island after collision; 357 American troops lost and 170 of the crew.

7.—French capture Berry-au-Bac.

Americans in Argonne capture Chéhéry and La Viergette.

British north of Scarpe capture Oppy and Biache-St. Vaast.

Italians in Albania occupy Elbasan.

French naval forces occupy Beirut.

8.—President Wilson asks Germany whether she accepts his terms and is prepared to limit negotiations to their practical application and whether the Chancellor speaks merely for the constituted authorities of the Empire, and declares that no cessation of arms can be proposed until the Germans evacuate all invaded territory.

Americans east of Meuse advance on eight-mile front, capturing Beaumont, Haumont, Brabant and Consenvoye, and taking 3,000 prisoners; in Argonne capture Cornay and pierce Kriemhilde line between Cunel and Romagne; French in Argonne capture Lancon and Grand Ham.

British, attacking on 20-mile front south of Cambrai, advance three miles, taking Beauregard, Brancourt, Serain, Malincourt, Villers-Outreaux, Lesdain and Esnes with 10,000 prisoners, and breaking the Beaurevoir-Masmieres line; French north of St. Quentin capture Fontaine and Rouvroy.

9.—British advance on whole front from Cambrai to St. Quentin, capturing Cambrai, Bohain, Busigny, Caudry and Caurior; north of Scarpe capture Sallaumines and Noyelles; French capture Fontaine, Essigny-le-Petit, and Beautroux, and cross Aisne Canal near Villers-en-Prayères.

10.—French on Chemin des Dames capture Chivy, Moulins, Verneuil; on Aisne, capture

Parguan and Beaurieux; in Champagne Germans retreat on wide front and French occupy Liry, Monthois, Challerange and Termes, and cross Suippe at several points.

British east of Cambrai capture Le Cateau, Vaux-Andigny, Avesnes, Rieux, Estrun and Louvroy, and reach the Selle from Solesmes to St. Souplet; French capture Servais, Regny, Chatillon and Thenelles.

Irish mail boat *Leinster* sunk by submarine; 400 lost.

11.—British east of Cambrai capture Biastre, Iwuy and Fressies, and north of the Scarpe Sailly, Vitry-en-Artois, Drocourt, Fouquières and Cuiney.

Americans complete clearing of Argonne forest.

American troops overseas announced as 1,900,000.

12.—Germany replies to President Wilson that his terms are accepted, that evacuation is agreed to, and that the present Government represents the people of Germany.

French completely occupy the bend of the Aisne, taking Vieux-les- Asfeld and Asfeld-la-Ville, Chivy, Bourgnignon, Faucaucourt, Prémontre, and St. Gobain, and crossing the Aisne at Guignicourt; north of Argonne French capture Vouziers.

British south of Douai capture Arleux and Corbenhem; east of Lens, occupy Montigny, Harnes and Annay; and east of Cambrai, capture St. Vaast, St. Aubert, Villers-en-Cauchies and Avesnes-le-Sec.

Serbians occupy Nish.

Japanese enter Irkutsk.

13.—French occupy La Fère, the massif of St. Gobain, and Laon, and advance to the line of Aizelleos, Berrieux and Amifontaine.

British cross Sensée Canal at Aubigny-au-Bac and penetrate suburbs of Douai.

14.—President Wilson informs Germany that any armistice must give the Allies guarantees that their military supremacy will be maintained, that no armistice is possible while Germany continues to practice inhumane methods of warfare, and that peace is conditioned on the destruction of German arbitrary power.

Allies open offensive on 25-mile front in Flanders; Belgians advance six miles to Iseghem; French capture Roulers; British capture Denaap, Gulleghem and Wevelghem.

French east of Laon capture Tissonne, La Malmaison, Lor, Le Thour, St. Germainmont, Remies, Barenton, Monceau, Nantheuil, Olizy and Termes.

Italians in Albania capture Durazzo and Tirana.

15.—Allies in Flanders capture Menin, Hooglede, Gits' Winkelhoek and Lendelede; British cross Haute Deule Canal at Pont-a-Vendin and capture Estevelles, Meurchin and Bauvin.

French in Champagne capture La Selve and Nizy.

Americans west of Meuse capture St. Juvin.

British in Syria occupy Homs.

16.—Americans north of the Argonne capture Grand Pré.

French in Champagne capture Notre Dame de Liesse, Acy-Romance and Talma.

Allies in Flanders, capture Keyem, Lichtervelde, Ardoye, Iseghem, Hulst and Comines, cross Lys between Armentières and Menin, and penetrate Courtrai; British advance between Douai and Lille to the line of Oignies, Carvin, Allenes, Maugre and Capinghem.

French invade Montenegro and occupy Diakova and Ipek.

Great Britain recognizes the Polish National Army as autonomous, allied and co-belligerent.

17.—British occupy Lille and Douai, land naval force at Ostend, and penetrate Courtrai and Tourcoing; Belgians enter Bruges and occupy Ingelmunster; French occupy Meulbeke and enter Thielt.

British, attacking on nine-mile front northeast of Bohain, capture Andigny-les-Fermes and cross the Selle on the whole front south of Le Cateau, taking 4,000 prisoners.

French on Oise capture Petit Verly and Origny.

18.—Belgians occupy Zeebrugge and Oostcamp; British occupy Turcoing and Roubaix, cross Sensée Canal on a wide front north of Cambrai, taking Emerchicourt and Pecquencourt, east of Bohain capture Wassigny, Ribeauxville, and Bazeul, and advance north of Douai to the line of Masny, Bersée, Fretin and Ascq.

French cross Aisne on both sides of Vouziers; west of Oise capture Mannevret, Tupigny, Ainsonville and Andigny Wood, and between Oise and Serre occupy ten villages on a wide front.

Americans capture Bantheville.

Allies in north Russia reported in Kadish and in complete occupation of central and southeastern Karelia.

President Wilson denies Austria-Hungary's request for armistice until national aspirations of Czechoslovaks and Jugoslavs are fully satisfied.

French on Oise capture Etreat and Ribemont; on Serre, Verneuil; on Aisne, St. Germainmont; and in the Argonne, Chestres.

British reach Sambre and Oise Canal north of Oisy, occupy Saulzoir, enter Denain and Tomaini capture Marchiennes, and advance north of Douai to the line of Occhies, Bourghelles, Templeuve and Nechin.

Belgians reach Dutch frontier.

Allies in Serbia occupy Zajechar, Bolyevatz and Trstenik.

Greeks reoccupy last Macedonian territory invaded by Bulgarians.

American steamer *Lucia* sunk by submarine in mid-Atlantic; four lost.

20.—British cross Selle north of Le Cateau and capture Solesmes, and in Flanders advance to the line of Pecq, Dottignies, Victe and Deerlyck.

Belgians advance to Deynze-Eecloo canal and the line of Aeltre, Adeghem, Bellem and Ursel; French cross Lys at Peteghem and Oyghem.

Allies in Serbia reach the Danube near Vidin.

21.—Germany publishes reply to President Wilson, describing process of democratization, agreeing to military determination of armistice terms, and protesting against charges of barbarity.

French northwest of Laon occupy Mesbrecourt and Richecourt.

British west of Valenciennes advance to line of La Sentinelle, St. Amand, Hongy and Taintegnies, and reach the Scheldt north of Tournai.

Czechoslovaks in France capture Terron-sur-Aisne.

22.—French north of Laon capture Chalandry and Grandlup.

British penetrate suburbs of Valenciennes, and about Tournai capture Ourcq, Froyennes, Hollain and Bruyelle.

Belgians advance to Lys canal from Deynze to Dutch frontier and cross at several points; French cross Lys south of Deynze and British cross Scheldt at Pecq.

23.—President Wilson, replying to German note, agrees to transmit request for armistice to Allies but warns that truce must leave Germany powerless.

British, attacking from Sambre Canal to the Scheldt, capture Romeries, Beaurain, Bousies, Vendegies, Escarmain, Neuville and Salesches, and cross the Ecaillon at Beaudignies; north of Valenciennes capture Bruay, Thiers, Hauterive and Thun.

French in Flanders capture Waereghem.

French cross Oise at Grand Verly.

Americans east of Meuse capture Brieulles.

French in Serbia occupy Negotin.

24.—Italians attacking between Brenta and Piave capture Monti Solarole, Pertica and Sisemol, cross Ornic River, and take 3,000 prisoners.

French cross Oise at Longchamps.

British south of Valenciennes capture Maing, Ors, Robersart, Thiant, Ghissignies, Verchaine, Ruesnes, Bermerain and Monchaux.

25.—Italians capture Monti Valderoa and Pertica, taking 2,000 prisoners.

French cross Serre between Crécy and Mortiers and capture Mortiers, Caumont, Pierrepont, St. Quentin-le-Petit and Recouvrance; east of Rethel capture Ambly and Fleury.

British reach Le Quesnoy-Valenciennes railway on a wide front, taking Sepmeries and Querenaing; north of Valenciennes capture Bruille, Buridon, Odomez and Maulde; in Flanders capture Engoghem and Ooteghem.

26.—Italians occupy Grave di Papadopoli Island, in the Piave.

French between Oise and Serre capture Pleine-Selve, Parpeville, Origny-Ste. Benoite, Courjumelles and Chevresis-Monceau.

British south of Valenciennes capture Englefontaine, Artres and Famars.

British in Syria occupy Aleppo.

General Ludendorff, Quartermaster-General of the German Army, resigns.

27.—German reply to President Wilson declares that a people's government now controls Germany, both actually and constitutionally, and invites armistice terms.

Italians cross Piave between Valdobbiadene and mouth of the Soligo, taking 9,000 prisoners.

French between Oise and Serre capture Boheries, Proix, Macquigny, Landifay, Crécy-sur-Serre and Montigny-sur-Crécy.

Allies in Serbia occupy Kragujevatz and Jogodina.

Italians in Albania occupy Alessio.

Cuban steamer *Chaparra* sunk by mine off Barnegat.

28.—Austria-Hungary accepts all conditions laid down by President Wilson and asks for an armistice and peace negotiations.

Italians north of Piave advance on whole front from Monte Grappa to Ponte, taking Valdobbiadene, Susegana, Monte Pionar and Alano di Piave.

29.—Austrian commander in Italy applies to General Diaz for cessation of hostilities and an armistice.

Austria-Hungary appeals to Secretary Lansing for intervention with the President to grant an armistice and open peace negotiations.

Italians capture Vittorio, Sesquisine Coneglians, Roncadelle, Ormielle and Fontanelle, extend crossing of Piave eastward to Santa Dona della Piave, and increase prisoners to 33,000.

French advance on seven-mile front between St. Quentin-le-Petit and Herpy.

Italians in Albania occupy San Giovanni di Medua.

30.—General Diaz admits Austrian delegates to pourparlers for an armistice; Austrian armistice mission enters Italian lines near Serravalle.

Italians pursuing retreating Austrians occupy Serravalle, Orsago, Gajarine, Oderzo, Sacile and Asiago.

British capture entire Turkish force on Tigris, taking 7,000 prisoners.

Turks conclude at Mudros armistice equivalent to total surrender.

Americans west of Meuse capture Aincreville.

General Gröner, Prussian Minister of War, appointed Quartermaster-General of the Imperial German Army.

31.—Armistice with Turkey effective at noon.

Armistice terms submitted to Austrians at Italian headquarters.

Italians capture Cismon Feltre, and many heights in the region of Monte Grappa and advance to the Livenza, increasing prisoners to 50,000.

Allies in Belgium advance on 15-mile front from Deynze to Avelghem, taking these and many other villages.

Italians occupy Scutari, Albania.

NOVEMBER

1.—Americans, attacking on 15-mile front west of Meuse, capture Landres, St. Georges, Remonville, Bayonville, Chenéry, Cléry and Landreville; French to the west cross Aisne and capture Semuy, Voncq, Falaise and Rilly.

Allies in Flanders reach Scheldt from Berchem to Gavere; taking Anseghem, Tieghien, Elsegem, Nazereth, Cruyshanten and Ville-Audenarde; British south of Valenciennes capture Aulnoye and Maresches.

Italians in the Trentino cross the frontier into the Sugana Valley; on the Asiago Plateau capture many heights, including Baldo and Longara; and occupy Belluno and Meduna and cross the Livenza.

Serbians occupy Belgrade and Semendria, the Germans retreating across the Danube.

Ukrainians occupy Lemberg, Galicia.

Austrian battleship *Viribus Unitis* sunk by Italian scout boat in Pola harbor.

2.—Americans west of Meuse, pursuing Germans retreating from the Freya line, capture Champigneulle, Thénorgues, Buzancy, Fosse, Barricourt, Villers-devant-Dun, Doulcon and Briquenay.

French east of the Aisne capture Semuy, Les Alleux, Longme and Primat.

British capture Valenciennes and Marly.

Italians capture Monte Majo, Lastebasse, Azzanodecimo, and Portogruaro, and cross the Tagliamento at Spilimbergo; in the mountains capture Monti Cimone and Lisser, Ponte nelle Alpi and Pordenone, and cross the Cellina-Meduna.

Austro-Hungarian War Offices announce immediate evacuation of all occupied Italian and Serbian territory.

American troops overseas announced as over 2,000,000.

3.—Austria-Hungary surrenders; armistice dictated by Allies signed at Italian headquarters, effective at 3 p. m. on Nov. 4; Italians capture Rovereto, Trent and Udine and a naval force occupies Trieste.

Americans west of Meuse advance to the line of Authe, Beauclair, Halles and Montigny.

French east of Aisne capture Toges, Noirval, Belleville, Châtillon-sur-Bar, Voncq and Chesne Wood.

Belgians advance along Dutch frontier to Ertvelde and approach Ghent; French and British cross Scheldt at Welden and Pofter.

4.—Hostilities cease between Allies and Austria-Hungary at 3 p. m.; Italian advance halted on the line of Sluderno, Cembra, Levico, Fiera di Primero, Tolmino, Gorzila, Cervignanio, Aquilesa and Grado; Italians land at Zara, Dalmatia.

Allies' Supreme War Council agrees to assist Austria, Turkey and Bulgaria in making available food supplies for the civil population.

Americans west of Meuse capture Verrières and Laneyville, and extend attack east of Meuse.

British advance on 30-mile front between Scheldt and Sambre-Oise Canal, taking Catillon, Hautrive, Landrécies, Le Quesnoy, Fresnoy, and several villages in Mormal Forest; French advance between Oisy and Vandencourt, taking Lesquielles and several other villages.

Belgians clear entire west bank of Tereneuzen Canal.

Serbians enter Bosnia and occupy Vardiste.

Ukrainian troops occupy Lemberg, Galicia.

Germany notifies the United States through Switzerland that since Oct. 1 German air forces had been ordered to attack nothing but military objects and protests against air raids on German towns.

United States recognizes the Polish National Committees autonomous and co-belligerent.

5.—President Wilson notifies Germany to apply to Marshal Foch for armistice terms, and quotes reservations by the Allies as to the interpretation of his peace terms.

Americans clear west bank of Meuse north to Pouilly and capture Beaumont, Yoncq and Stonne; cross Meuse below Dun-sur-Meuse and capture the town.

Allies advance on the whole front from Valenciennes to Rethel, taking Mormal Forest, Barzy, Grand Fayt, Berlaimont, Fresnes, Guise, Crupilly, Romery, Marle, Herpy and Château-Porcien; French cross Aisne near Nanteuil, and in the Argonne capture Montgon and Le Chesne.

Italians occupy Fiume and the Dalmatian islands Lissa and Lagosta.

Polish authorities reported to have assumed control of Galicia.

6.—Americans west of Meuse enter Sedan, having captured Villemontry, Autricourt, Haraucourt, Rancourt, and many other towns; east of Meuse capture Fontaines.

Allies pursuing the Germans retreating between the Scheldt and the Meuse occupy Quievrechain, Leval, Aulnoye, Cartignies, Marbaix, Vervins, Montcornet, Rozoy, Begny, Rethel and Dyonne.

7.—German Army headquarters requests meeting with Marshal Foch armistice mission headed by Mathias Erzberger leaves Spa and enter French lines near La Capelle.

Allies recover more than 100 villages between the Scheldt and the Meuse, including Bavai, La Capelle, Flouges, Origny, Lenz, Mazerny and St. Aignan; French cut the La Capelle-Hirson railway.

Serbians cross Danube and Save into Hungary.

Great Britain and France declare their intention to liberate completely and finally the oppressed peoples of the Near East and establish governments chosen by the native populations.

8.—Marshal Foch delivers armistice terms to Germans, granting 72 hours for reply and denying a request for a suspension of hostilities.

Americans east of the Meuse clear the entire heights of the Woevre, taking Lissey, Danvillers, Flabas and many other towns.

French capture Fresnoy and penetrate Mezières.

British penetrate Tournai, cross Scheldt Canal south of Antoing, and capture La Piaigne, Belloy, Malplaquet, Thulin, Avesnes and Hautmont.

9.—Americans east of Meuse capture Mouay, Dun, Jametz, Remoiville, and Chaumont.

French capture Hirson, Signy, Wagny, and many other villages, advancing at some points nine miles on a 30-mile front.

British capture Tournai, Antoing and Mauberge and cross the Scheldt on a wide front; French in Belgium capture Welden, Edelaere and Melden.

Serbians enter Serajevo, Bosnia.

British battleship *Britannia* sunk by submarine off Gibraltar.

American steamer *Saltia* sunk by mine off Maryland coast.

10.—Americans extend attack eastward from Meuse 71 miles to the Moselle near Pont-a-Mousson; capture Stenay, Grimaucourt, Marchéville, St. Hilaire, and several villages in Lorraine.

French capture Eppe-Sauvage, Maubert-Fontaine, Rimogne and Sormonne.

British capture Lenze and Renaix and penetrate Mons.

11.—Germany surrenders; armistice dictated by Allies signed at 5 a. m.; hostilities cease at 11 a. m.

German Foreign Secretary Solf appeals to President Wilson to mitigate the conditions of the armistice.

British capture Mons; French capture Rocrói and cross Meuse between Vrigne and Lumes; Belgians occupy Ghent.

12.—German Government asks the United States through Switzerland whether foodstuffs will be sent immediately to Germany if public order is maintained; President Wilson replies that he is ready to consider favorably supplying food to Germany and to take up the matter with the Allied Governments.

German Foreign Secretary Solf appeals to President Wilson for immediate opening of negotiations for a preliminary peace.

Lloyd George declares that there must be a just peace, not a peace of vengeance.

Germans begin evacuation of France and Belgium.

13.—Allied High Command notifies Germany that there can be no modification of armistice terms.

King Albert of Belgium enters Ghent.

Allied fleet arrives off Constantinople.

British Admiralty makes official announcement of the sinking of the battleship *Audacious* on Oct. 27, 1914.

15.—Secretary Lansing advises the German Government to address its communications to all the Allies instead of the United States alone; the German Government asks the United States to send delegates immediately to discuss the food situation.

German naval delegates arrange details of surrender of German fleet with Sir David Beatty off Rosyth.

16.—German Government asks President Wilson to permit a German food commission to visit the United States.

Belgian troops enter Brussels and Antwerp.

17.—Americans begin advance into evacuated territory and enter Montmédy.

French occupy Mulhouse, Sedan, Gravelotte forts, Münster and Altkirch.

British begin advance into evacuated Belgian territory.

Australian Senate adopts a resolution against return of Pacific islands to Germany.

18.—German Government asks mitigation of armistice terms relating to left bank of Rhine to prevent spread of Bolshevism.

19.—French headed by General Pétain enter Metz; Americans occupy Longwy and Briey.

King Albert of Belgium enters Antwerp.

20.—Twenty German submarines surrendered to the British off Harwich.

Great Britain notifies Germany that no food will be allowed to reach her unless cruelties to British prisoners cease.

Americans enter Luxemburg and Lorraine; French occupy Sarrebruck and reach Rhine at Neuf Brisach.

French troops enter Budapest.

21.—German fleet of nine battleships, five battle cruisers, seven light cruisers and 50 destroyers surrendered to the Allies in the North Sea; 19 additional submarines surrendered off Harwich.

Americans headed by General Pershing enter Luxemburg; General Pershing issues a proclamation relating to the Allied occupation.

British occupy Namur.

Poles reported in possession of the town and most of the province of Posen.

22.—King Albert of Belgium enters Brussels.

Twenty German submarines surrendered off Harwich.

23.—Americans reach the German frontier of Luxemburg.

24.—Twenty-eight German submarines surrendered off Harwich.

25.—French headed by Marshal Pétain enter Strasbourg.

Allied fleet reaches Sebastopol; Russian and German ships surrendered.

Allied naval force arrives at Odessa.

Bolshevist troops capture Pskov, Esthonia.

27.—Twenty-seven German submarines surrendered at Harwich.

28.—Two squadrons of British warships including transports enter the Baltic.

British reach the German-Belgian frontier between Reho and Stavelot.

29.—Lloyd George, speaking at Newcastle, declares that the German Emperor must be brought to justice and that Germany must pay the cost of the war to the limit of her capacity.

Allies in northern Russia reported in Karpagorskoi.

DECEMBER

1.—Americans cross Sauer and Moselle into Germany and occupy Saarburg and Treves; British cross Belgian frontier.

Eight German submarines surrendered off Harwich.

2.—A British fleet arrives at Libau.

3.—Belgians occupy Aix-la-Chapelle.

British cross Belgian frontier into Germany and occupy Malmedy.

4.—Winston Churchill announces that Great Britain will consent to no limitation of her naval supremacy.

5.—British Admiralty announces surrender of entire Turkish fleet and of all Russian and German warships in the Black Sea.

British naval squadron arrives at Wilhelmshaven.

British warship *Cassandra* sunk by mine in Baltic.

Winston Churchill announces that Great Britain will demand at peace conference general abolition of conscription.

6.—Belgians occupy Düsseldorf, on the Rhine; British enter Cologne.

7.—French and Americans take over Aix-la-Chapelle from the Belgians.

8.—Americans occupy Coblenz.

British reach Rhine between Cologne and Godesberg.

Henri Philippe Pétain created a marshal of France at Metz.

9.—Americans reach Rhine from Rolandseck to Brohl; French occupy Mainz.

10.—Americans occupy fortress of Ehrenbreitstein, opposite Coblenz; Belgians occupy Düsseldorf.

11.—Lloyd George, speaking at Bristol, declares Germany must pay Allies war bill of $120,000,000,000 to utmost limit of her capacity.

12.—British cross Rhine at Cologne and occupy Bonn.

13.—President Wilson arrives in France.

Three American divisions cross Rhine at Coblenz.

British complete occupation of Cologne bridgehead.

American naval squadron arrives at Pola.

French marines occupy Odessa.

14.—Armistice with Germany extended to Jan. 17 in conference at Treves.

President Wilson arrives in Paris; declares a league of nations essential to enduring peace; President Poincaré declares victory vain if German atrocities remain unpunished.

15.—Americans complete occupation of Coblenz bridgehead.

18.—Polish troops from France occupy Danzig.

British battleship *Hercules* passes through the Kiel Canal.

19.—President Wilson confers with King Victor of Italy in Paris.

25.—President Wilson reviews and addresses American troops at Chaumont, France, promising them a just peace.

26.—President Wilson arrives at London as the guest of King George.

27.—French occupy Mannheim to watch over welfare of Allied prisoners.

Polish Government in ultimatum demands passage of troops over German held railways to Vilna, threatened by Bolsheviki.

Poles defeat Germans in street fighting in Posen provoked by insult to American flag.

28.—President Wilson, speaking at the Guildhall, declares there must be an overwhelming group of nations to insure the peace of the world.

29.—Stephen Pichon, Foreign Minister, outlines France's peace aims in Chamber of Deputies and declares for a League of Nations.

Premier Clemenceau declares his adherence to the balance of power and that France will support Great Britain on the question of the freedom of the seas, and is given a vote of confidence by the Chamber.

30.—Hungarian Government reported to have decided upon internment of General Mackensen's army of 170,000 men.

31.—President Wilson returns to Paris.

AMERICAN NECROLOGY

ADAMS, Charles Follen, 75, Boston, March 8; author.

ADAMS, Henry, 80, Washington, March 27; historian.

ADLER, Isaac, 69, New York, May 4; physician.

ALEXANDER Charles Tripler, 84, Washington, March 1; brigadier-general, U. S. A. retired.

ALLISON, James Nicholls, 69, Portland, Ore., May; brigadier-general, U. S. A., retired.

ANDERSON, Galusha, 86, Newton, Mass., July 20; Baptist clergyman, professor emeritus of theology in University of Chicago.

ANDREWS, Charles, 90, Syracuse, Oct. 22; judge of the New York Court of Appeals, 1870-97.

ANDREWS, Horace Ellsworth, 55, New York, Dec. 1; financier and railroad official.

ARDEN, Edwin Hunter Pendleton, 54, New York, Oct. 2; actor and playwright.

ARMSTRONG, David Maitland, 82, New York, May 26; artist.

BACON, Alice Mabel, 60, New Haven, Conn., May 2; author.

BAKER, Bernard Nadal, 64, Santa Barbara, Cal., Dec. 20; member of the U. S. Shipping Board, 1916.

BAKER, James Barnes, 54, New York, June 3; architect.

BANCROFT, Hubert Howe, 85, Walnut Creek, Cal., March 2; historian.

BARNES, Thurlow Weed, 65, New York, June 27; promoter.

BARTINE, Horace F., 70, Winnemucca, Nev., Aug. 27; former Representative from Nevada.

BARTLETT, John R., 79, Monroe, N. Y., June 4; financier.

BASS, Edgar Wales, 75, New York, Nov. 6; colonel, U. S. A., retired, late professor of mathematics at West Point.

BATES, Arlo, 67, Boston, Aug., 25; professor of English in Massachusetts Institute of Technology.

BEACH, Frederick Converse, 70, Stratford, Conn., June 8; editor of *Encyclopedia Americana.*

BELL, Clark, 85, New York, Feb. 22; lawyer.

BENNETT, James Gordon, 77, Beaulieu, France, May 14; proprietor of the *New York Herald.*

BESEMER, Howard Burhans, 48, Ithaca, N. Y., Feb. 8; surgeon.

BLACKBURN, Joseph Clay Styles, 79, Washington, Sept. 12; Senator from Kentucky, 1885-97 and 1901-7.

BLAKE, John George, 80, Boston, March 4; physician.

BLANKENBURG, Rudolph, 75, Philadelphia, April 12; Mayor of Philadelphia, 1912-16.

BLASHFIELD, Evangeline Wilbour (Mrs. Edwin H.), 59, New York, Nov. 15; author.

BOCHER, Maxime, 51, Cambridge, Mass., Sept. 12; professor of mathematics in Harvard University.

BOLLING, Raynal Cawthorne, 41, missing in action in France; April, lawyer, colonel, U. S. A.

BOURNE, Randolph, 32, New York, Dec. 22; editor and author.

BOWERS, John M., 67, Lakewood, N. J., March 7; lawyer.

BRACKETT, John Quincy Adams, 75, Arlington, Mass., April 6, Governor of Massachusetts, 1890-1.

BRADY, James H., 55, Washington, Jan. 13; Senator from Idaho since 1913.

BRADY, John Green, 70, Sitka, Alaska, Dec. 17; Governor of Alaska, 1897-1909.

BRAUN, Ferdinand, 68, New York, April 20; physicist.

BREVOORT, James Renwick, 86, Yonkers, N. Y., Dec. 15; painter.

BRODIE, Alexander Oswald, 68, Haddonfield, N. J., May 10; colonel, U. S. A., retired; Governor of Arizona, 1902-5.

BROOKE, Francis Key, 65, Chicago, Oct. 22; Protestant Episcopal Bishop of Oklahoma.

BROUSSARD, Robert F., 53, New Iberia, La., April 12; Representative from Louisiana, 1897-1915, Senator since 1915.

BRYAN, Charles Page, 61, Washington, March 13; ambassador to Japan, 1911-12.

BURTON, Henry Fairfield, 67, Conesus, N. Y., Aug. 28; professor of Latin in the University of Rochester.

BUTLER, John Wesley, 66, Mexico City, March 17; Methodist missionary in Mexico.

CAFFIN, Charles Henry, 63, New York, Jan. 14; art critic, author.

CALDWELL, Eugene Wilson, 47, New York, June 20; Roentgenologist.

CALHOUN, John Caldwell, 75, New York, Dec. 18; financier.

CAMERON, James Donald, 85, Donegal, Pa., Aug. 30, Secretary of War, 1876-7, Senator from Pennsylvania, 1877-97.

CAMPBELL, Thomas W., 66, New York, March 26; Presbyterian clergyman.

CAPSTICK, John H., 61, Montville, N. J., March 17; Representative from New Jersey since 1915.

CARLL, Lewis Buffett, 74, New York, March 22; mathematician.

CARPENTIER, Horace W., 92, New York, Jan. 21; capitalist.

CARTER, Robert, 44, Philadelphia, Feb. 27; cartoonist.

CASTLEMAN, John Breckinridge, 76, Louisville, Ky., May 23; Confederate soldier.

CHAPIN, John Bassett, 88, Canandaigua, N. Y., Jan. 17; psychiatrist.

CHAPLIN, Winfield Scott, 70, St. Louis, March 12; engineer, late chancellor of Washington University.

CHAPMAN, J. Wilbur, 59, Jamaica, N. Y., Dec. 25; Presbyterian evangelist.

CHASE, William Martin, 80, Concord, N. H., Feb. 3; former justice of the New Hampshire Supreme Court.

CHATARD, Francis Silas Marean, 83, Indianapolis, Sept. 7; Roman Catholic Bishop of Indianapolis.

CLARK, Alonzo Howard, 68, Washington, Dec. 31; editor of the Smithsonian Institution.

CLARK, Isaac, 85, Summit, N. J., Sept. 2; Presbyterian clergyman, late dean of theology in Howard University.

CLARK, Nathaniel Walling, 59, New York, March 12; Methodist clergyman, late president of the Methodist College in Rome.

CLARKSON, James S., 76, Newark, N. J., May 31; First Assistant Postmaster-General, 1889-90, Surveyor of Port of New York, 1902-10.

CLAYTON, Bertram Tracy, 55, killed in France, June, colonel, U. S. A., Representative from New York, 1899-1901.

CLEGG, Moses Tran, 41, Honolulu, Aug. 10; bacteriologist.

COLLIER, Robert Joseph, 42, New York, Nov. 8; editor and publisher of *Collier's Weekly.*

CONVERSE, Charles Crozat, 86, Englewood, N. J., Oct. 18; lawyer, composer.

COOPER, Sam Bronson, 68, New York, Aug. 21; Representative from Texas, 1893-1905 and 1907-9.

COURTNEY, Frederick, 81, New York, Dec. 29; Protestant Episcopal Suffragan Bishop of New York.

COWIN, John Clay, 72, Omaha, Neb., Dec. 22; lawyer.

CRAGIN, Edwin Bradford, 59, New York, Oct. 21; gynecologist and obstetrician.

CROTHERS, Thomas Davison, 75, Hartford, Conn., Jan. 13; physician.

CROWNINSHIELD, Frederic, 72, Capri, Italy, Sept. 13; artist.

CURRIE, Donald Herbert, 42, Boston, Dec. 23; sanitarian.

CURRIER, Charles Warren, 61, Baltimore, Sept. 23; late Roman Catholic Bishop of Matanzas, Cuba.

CURTIS, Olin Alfred, 67, Leonia, N. J., Jan. 8; professor emeritus of systematic theology in Drew Theological Seminary.

CUSACK, Thomas Francis, 56, Albany, N. Y., July 12; Roman Catholic Bishop of Albany,

CUTLER, Arthur Hamilton, 69, New York, June 21; educator.

DANFORTH, Henry Gold, 62, Rochester, N. Y., April 8; Representative from New York 1911-17.

DANIELS, William Cook, Buenos Aires, March 18; merchant, explorer.

DAVIDSON, James Henry, 60, Washington, Aug. 6; Representative from Wisconsin, 1897-1913 and since 1917.

DAVIS, George Whitefield, 78, Washington, July 12; major-general, U. S. A., retired.

DAY, Frank Miles, 57, Philadelphia, June 17; architect.

DE LAMAR, Joseph Raphael, 75, New York, Dec. 1; capitalist.

DE ROALDES, Arthur Washington, 69, New Orleans, June 12; surgeon.

DE SOLA, Meldola, 64, New York, April 29; Jewish rabbi.

DEARTH, Henry Golden, 53, New York, March 27; painter.

Dennis, James Teackle, 52, Woodbrook, Md., April 1,; Egyptologist.

Dickie, George William, 74, Oakland, Cal., Aug. 16; naval architect.

Dimock, Anthony Weston, 76, Peekamose, N. Y., Sept. 12; author.

Dixon, Samuel Gibson, 66, Philadelphia, Feb. 26; bacteriologist, Commissioner of Health of Pennsylvania.

Donald, James Mackie, 64, Ewing, N. J., Sept. 23; banker.

Douglas, James, 80; New York, June 25; mining engineer.

Doyen, Charles Augustus, 59, Quantico, Va., Oct. 7; brigadier-general, U. S. M. C.

Du Bose, William Porcher, 82, Sewanee, Tenn., Aug. 19; dean emeritus of theology in University of the South.

Du Faur, Adolph Faber, Newark, N. J., Aug. 18; mining engineer.

Eastman, Charles Rochester, 50, Long Beach, N. Y., Sept. 27; palæontologist.

Elder, Samuel James, 68, Boston, Jan. 22; lawyer.

Ewing, James Stevenson, 82, Bloomington, Ill., Feb. 7; U. S. Minister to Belgium, 1893-7.

Fairbanks, Charles Warren, 66, Indianapolis, June 4; Vice-President of the United States, 1905-9.

Farley, John Murphy, 76, Mamaroneck, N. Y., Sept. 17; Cardinal Archbishop of New York.

Farrell, James Charles, 48, Albany, N. Y., Dec. 28; capitalist.

Faxon, Charles Edward, 72, Boston, Feb. 6; botanical artist.

Fernald, James Champlin, 80, Montclair, N. J., Nov. 10; Baptist clergyman, editor.

Ferris, Morris Patterson, 63, Garden City, N. Y., Oct. 26; lawyer.

Field, Cortlandt de Peyster, 78, Peekskill, N. Y., Aug. 8; merchant.

Fitch, Charles Elliott, 82, Syracuse, N. Y., Jan. 13; journalist.

Foley, John Samuel, 84, Detroit, Jan. 5; Roman Catholic Bishop of Detroit.

Ford, John Donaldson, 77, Baltimore, April 8; rear-admiral, U. S. N., retired.

Foster, George Burman, 60, Chicago, Dec. 22; professor of religious philosophy in Chicago University.

Frick, William Keller, 68, Milwaukee, Aug. 20; Lutheran clergyman.

Fuller, William Elijah, 72, Washington, April 23; lawyer, Representative from Iowa, 1885-89.

Fulton, Charles William, 64, Portland, Ore., Jan. 27; Senator from Oregon, 1903-9.

Funsten, James Bowen, 62, Boise, Idaho, Dec. 1; Protestant Episcopal Bishop of Idaho.

Gallinger, Jacob H., 81, Franklin, N. H., Aug. 17; Senator from New Hampshire since 1891.

Gardner, Augustus Peabody, 52, Macon, Ga., Jan. 14; major, U. S. A., Representative from Massachusetts, 1902-17.

Gill, William Andrew, 59, Bridgeport, Conn., Oct. 10; rear-admiral, U. S. N.

Gillette, Edward Hooker, 77, Valley Junction, Iowa, Aug. 14; Representative from Iowa, 1879-81.

Gilmore, Joseph Henry, 84, Rochester, July 23; Baptist clergyman, late professor of English in University of Rochester.

Gladden, Washington, 82, Columbus, O., July 2; Congregationalist clergyman, author.

Goldsborough, Worthington, 83, Baltimore, April 23; pay director, U. S. N., retired.

Gottschalk, Alfred L. M., 45, at sea with *Cyclops*, March; U. S. consul-general at Rio de Janeiro since 1914.

Gould, Frank Horace, 61, Washington, Jan. 26; Surveyor-General of the Department of the Interior, lawyer.

Gowdy, John Kennedy, 74, Rushville, Ind., June 25; U. S. consul-general at Paris, 1897-1905.

Graham, Edward Kidder, 42, Chapel Hill, N. C., Oct. 26; president of University of North Carolina.

Grant, Lewis Addison, 89, Minneapolis, March 19; Assistant Secretary of War, 1890-3.

Green, Samuel Abbott, 88, Boston, Dec. 5; physician, former Mayor of Boston.

Guenther, Francis Luther, 80, New York, Dec. 5; brigadier-general, U. S. A., retired.

Guernsey, Rocellus Sheridan, 82, New York, Dec. 9; lawyer, author.

Gulick, Luther Halsey, 52, South Casco, Me., Aug. 13; educator, author.

Hale, Eugene, 82, Washington, Oct. 27; Senator from Maine, 1881-1911.

Haley, George Franklin, 62, Saco, Me., Feb. 19; justice of the Maine Supreme Court.

Halsey, Frederic Robert, 71, New York, Sept. 29; print collector.

Halsted, Byron David, 66, New Brunswick, N. J., Aug. 28; professor of botany in Rutgers College.

Hamilton, Franklin Elmer Ellsworth, 51, Pittsburgh, May 5; Methodist Episcopal Bishop of Pittsburgh.

Hardenbergh, Henry Janeway, 71, New York, March 13; architect.

Hart, Charles Henry, 71, New York, July 29; art expert, author.

Hawks, Annie Sherwood, 82, Bennington, Vt., Jan. 3; hymn writer.

Hazard, Rowland Gibson, 63, Santa Barbara, Cal., Jan. 23; manufacturer.

Held, Anna, 47, New York, Aug. 12; actress.

Hervey, William Addison, 48, Princeton, N. J., Dec. 25; professor of German in Columbia University.

Hillegas, Howard Clemens, 45, New York, Jan. 29; journalist, author.

Hinckley, Thomas, 30, London, Nov. 6; secretary of the American Embassy at Rome.

Hitchcock, James Ripley Wellman, 60, New York, May 4; author, editor and publisher.

Hoard, William Dempster, 82, Milwaukee, Nov. 22; Governor of Wisconsin, 1889-92.

Hobbs, Icabod Goodwin, 75, Newport, R. I., Dec. 3; rear-admiral, U. S. N.

Hooker, Ellen Kelley, 85, New York, Sept. 29; educator.

Hooper, William Leslie, 63, Medford, Mass., Oct. 3; professor of electrical engineering in Tufts College.

Horsman, Edward Imeson, 44, Summit, N. J., July 27; music critic, composer.

Hovey, Henrietta (Mrs. Richard), 69, Pasadena, Cal., March 16; author.

Howell, John Adam, 77, Warrenton, Va., Jan. 10; Rear-admiral, U. S. N., retired, inventor.

Howell, Joseph, 61, Logan, Utah, July 18; Representative from Utah, 1903-17.

Hughes, William, 45, Trenton, N. J., Jan. 30; Senator from New Jersey since 1913.

Hunter, Thomas Marvin, 80, Worcester, Mass., March 4; actor.

Hutton, Frederick Remsen, 64, New York, May 14; professor emeritus of mechanical engineering in Columbia University.

Ireland, John, 80, St. Paul, Sept. 25; Roman Catholic Archibishop of Minnesota.

Irving, John Duer, 43, at the front in France, July 28; professor of economic geology in Yale University.

James, Ollie M., 47, Baltimore, Aug. 28; Senator from Kentucky since 1913.

Johnson, Henry, 62, Brunswick, Me., Feb. 7; professor of modern languages in Bowdoin College.

Johnston, Lawrence Albert, 62, St. Paul, June 10; Lutheran clergyman.

Jones, Daniel Webster, 79, Little Rock, Ark. Dec. 25; Governor of Arkansas, 1897-1901.

Jones, Jenkin Lloyd, 74, Tower Hill, Wis., Sept. 12; Unitarian clergyman.

Jones, John Edward, 50, Alexandria Co., Va., May 20; U. S. consul at Lyons, France.

Jones, William Atkinson, 69, Washington, April 17; Representative from Virginia since 1891.

Keane, John Joseph, 78, Dubuque, Iowa, June 22; late rector of the Catholic University of America and Archbishop of Dubuque.

Kearns, Thomas, 56, Salt Lake City, Oct. 18; Senator from Utah, 1901-5.

Kellogg, Luther Laflin, 69, New York, Dec. 6; lawyer.

Kempster, Walter, 77, Milwaukee, Aug. 22; physician.

Kennedy, Crammond, 75; Washington, Feb. 20; lawyer.

Kennedy, William, 63, Naugatuck, Conn., June 19; Representative from Connecticut, 1913-15.

Kennon, Lyman Walter Vere, 60, New York, Sept. 9; colonel, U. S. A.

Kent, William, 67, Gananoque, Ontario, Sept. 18; mechanical engineer.

Kilmer, Joyce, 31, killed in action in France, August 1; journalist, author.

King, Arno Warren, Ellsworth, Me., July 21; justice of the Maine Supreme Court.

King, Horatio Collins, 80, New York, Nov. 15; Civil War veteran, journalist and lawyer.

Klein, Joseph Frederic, 68, Bethlehem Pa., Feb. 11; professor of mechanical engineering in Lehigh University.

Knott, Aloysius Leo, Baltimore, April 18; lawyer, second assistant Postmaster-General, 1885-89.

KNOWLTON, Marcus Perrin, 79, Springfield, Mass., May 7; late chief justice of Massachusetts Supreme Court.

KOBBE, Gustav, 60, Bayshore, N. Y., July 27; music critic, author.

KOENIG, Otto, 53, Battle Creek, Mich., Sept 23; publisher of the *Christian Herald*.

KOHLSAAT, Christian Cecil, 74, Chicago, May 11; judge of the U. S. Circuit Court of Appeals.

KOUNTZE, Luther, 75, New York, April 17; banker.

KRAUTHOFF, Louis Charles, 60, New York, Oct. 26; lawyer.

LANDIS, John Howard, 57, Chicago, Aug. 23; physician.

LARREMORE, Wilbur, 63, New York, Aug. 11; editor of the *New York Law Journal*.

LEACH, Abby, 63, Poughkeepsie, N. Y., Dec. 29; professor of Greek in Vassar College.

LEHY, John Francis, 68, Poughkeepsie, N. Y., Nov. 26; former president of Holy Cross College.

LEONARD, Charles Hall, 95, Somerville, Mass., Aug. 27; Universalist clergyman, dean emeritus of Crane Theological School of Tufts College.

LEUPP, Francis Ellington, 69, Washington, Nov. 19; journalist, Commissioner of Indian Affairs, 1905-9.

LIAUTARD, Alexander Francis, 83, Bois Jerome, France, April 20; former dean of New York University Veterinary College.

LIVERMORE, Thomas Leonard, 73, Boston, Jan. 10; financier.

LOVE, William de Loss, 66, Hartford, Conn., April 6; Congregational clergyman, author.

LUFBERY, Raoul, 34, killed in action in France, May 19; aviator, major, U. S. A.

LYMAN, Charles Parker, 70, Los Angeles, Feb. 1; late dean of the Harvard School of Veterinary Medicine.

MABIE, Henry Clay, 70, Boston, April 30; Baptist clergyman.

MACCRACKEN, Henry Mitchell, 78, Orlando, Fla., Dec. 24; Chancellor emeritus of New York University.

MACKUBIN, Florence, 52, Baltimore, Feb. 2; portrait painter.

MADIGAN, John B., Houlton, Me., Jan. 19; justice of the Maine Supreme Court.

MAHL, William, 74, Atlantic City, N. J., May 13; late comptroller of the Southern Pacific and Union Pacific Rys.

MANN, Charles Holbrook, 78, New York, April 10; Swedenborgian clergyman.

MANN, Parker, 65, Princeton, N. J., Dec. 15; painter.

MANSFIELD, Henry Buckingham, 72, New York, July 17; rear-admiral, U. S. N., retired.

MARTIN, Alvah Howard, 59, Norfolk, Va., July 6; banker.

MARTIN, Don, 47, Paris, Oct. 6; war correspondent of the *New York Herald*.

MARVIN, Frederic Rowland, 70, Albany, N. Y., July 22; Congregational clergyman, author.

MAYER, Marcus, 76, Amityville, N. Y., May 8; impresario.

MCCREA, Tully, 79, West Point, N. Y., Sept. 5; brigadier-general, U. S. A., retired.

MCCREARY, James Bennett, 80, Richmond, Ky., Oct. 8; Senator from Kentucky, 1903-9.

MCDONALD, William C., 59, El Paso, Tex., April 11; Governor of New Mexico, 1912-16.

MCELROY, William H., New York, Nov. 7; journalist and lecturer.

MCGINNESS, John Randolph, 78, Mt. Clemens, Mich., Dec. 17; brigadier-general, U. S. A., retired.

MCGOLRICK, James, 76, Duluth, Jan. 23; Roman Catholic Bishop of Duluth.

MCKELWAY, Alexander Jeffrey, 51, Washington, April 16; Presbyterian clergyman.

MCKIBBIN, Chambers, 77, Washington, Dec. 30; brigadier-general, U. S. A., retired.

MEEKER, Jacob Edwin, 40, St. Louis, Oct. 16; Representative from Missouri since 1915.

MERICA, Charles Oliver, 54, Kendallville, Ind., July 24; late president of the University of Wyoming.

MESTREZAT, Stephen Leslie, 70, Philadelphia, April 28; justice of Pennsylvania Supreme Court.

MEYER, George von Lengerke, 59, Boston, March 9; Ambassador to Italy, 1900-5, and to Russia, 1905-7, Postmaster-General, 1907-9, Secretary of the Navy, 1909-13.

MICHIE, Robert Edward Lee, 54, near Rouen, France, June 5; brigadier-general, U. S. A.

MILDENBERG, Albert, 46, New York, July 3; composer.

MILLER, Harriet Mann ("Olive Thorne"), 87, Los Angeles, Cal., Dec. 25; author.

MILLER, Jacob William, 70, New York, March 8; financier.

MILLER, Warner, 79, New York, March 21; Senator from New York, 1881-7.

MITCHEL, John Purroy, 38, Lake Charles, La., July 6; major, U. S. A., Mayor of New York, 1914-17.

MITCHELL, John Ames, 73, Ridgefield, Conn., June 29; editor of *Life*.

MITCHELL, Maggie (Margaret Julia, Mrs. Charles Abbott), 85, New York, March 22; actress.

MOORE, Rufus Ellis, 78, New York, March 29; art collector.

MORRIS, George Kenneth, 81, Newton, Mass., Dec. 23, Methodist clergyman.

MOTT, Valentine, 65, New York, June 19; surgeon.

MUNSELL, Albert Henry, 60, Brookline, Mass., June 28; portrait painter.

MYERS, Theodore Walter, 74, New York, March 20; banker.

NEWMAN, William H., 70, New York, Aug. 10; late president of the New York Central Railroad.

NICOLL, James Craig, 70, Norwalk, Conn., July 25; painter.

NORTON, Richard, 46, Paris, Aug. 2; archæologist, organizer of the American Ambulance Corps.

OLMSTED, Charles Tyler, 76, Saybrook, Conn., Protestant Episcopal Bishop of Colorado.

OLYPHANT, Robert Morrison, 93, New York, May 3; late president of the Delaware & Hudson Ry.

O'MEARA, Stephen, 64, Boston, Dec. 14; newspaper editor, police commissioner of Boston.

O'REAR, John Davis, 48, La Paz, July 14; U. S. Minister to Bolivia since 1913.

OSGOOD, Herbert Levi, 63, Brentwood, N. Y., Sept. 11; professor of history in Columbia University.

PAGE, Edward Day, 62, Oakland, N. J., Dec. 25; merchant.

PAGE, Logan Waller, 48, Chicago, Dec. 9; Director of the U. S. Office of Public Roads.

PAGE, Walter Hines, 63, Pinehurst, N. C., Dec. 21; U. S. Ambassador to Great Britain, 1913-18, publisher.

PALMER, Arthur Hubbell, 59, New Haven, Conn., Nov. 6; professor of German in Yale University.

PALMER, Bertha Honoré (Mrs. Potter), Sarasota, Fla., May 5; social leader.

PATON, William Agnew, 70, New York, Dec. 11; publisher and author.

PECKHAM, Stephen Farnum, 79, New York, July 11; chemist.

PELZ, Paul Johannes, 76, Washington, March 30; architect.

PERRY, Thomas, 73, Southern Pines, N. C., March 7; rear-admiral, U. S. N., retired.

PETERS, Madison Clinton, 58, New York, Oct. 12; Baptist clergyman.

PEYTON, John Howe, 54, Nashville, Tenn., Sept. 14; president of the Nashville, Chattanooga & St. Louis Ry.

PLUME, Joseph Williams, 78, Newark, N. J., Jan. 12; banker, soldier.

POLK, William Mecklenburg, 73, Atlantic City, N. J., June 24; gynecologist, dean of Cornell Medical School.

POPE, George, 74, Hartford, Conn., April 19; bicycle manufacturer.

POTTER, William Plumer, 60, Swarthmore, Pa., April 14; justice of the Pennsylvania Supreme Court.

PRENDERGAST, Edmond Francis, 74, Philadelphia, Feb. 26; Roman Catholic Archbishop of Philadelphia.

PROUTY, George Herbert, 56, Waterville, Que., Aug. 19; Governor of Vermont, 1908-10.

PUTNAM, James Jackson, 72, Boston, Nov. 4; neurologist.

PUTNAM, William Le Baron, 82, Portland, Me., Feb. 5; former judge of the U. S. Circuit Court of Appeals.

RANDALL, George Morton, 76, Denver, June 14; major-general, U. S. A., retired.

RANDOLPH, Alfred Magill, 81, Norfolk, Va., April 6; Episcopal Bishop of Southern Virginia.

RATHBUN, Richard, 66, Washington, July 16; curator of the U. S. National Museum.

RAUSCHENBUSCH, Walter, 56, Rochester, N. Y., July 25; professor of church history in the Rochester Theological Seminary.

Raymond, Andrew Van Vranken, 63, Spartanburg, S. C., April 5; Presbyterian clergyman, president of Union College, 1894–1907.

Raymond, Rossiter Worthington, 78, New York, Dec. 31; mining engineer, editor, and author.

Reed, Alfred, 78; Trenton, N. J., Dec. 6; former justice of the New Jersey Supreme Court.

Remington, Joseph Price, 70, Philadelphia, Jan. 1; dean of the Philadelphia College of Pharmacy.

Richardson, Frank Chase, 58, Roxbury, Mass., June 20; neurologist.

Richardson, Leander, 61, New York, Feb. 2; journalist, playwright.

Ricketts, Pierre de Peyster, 70, New York, Nov. 20; chemical engineer.

Rideing, William Henry, 65, Brookline, Mass., Aug. 22; editor.

Ritz, Cæsar, 70, Lucerne, Switzerland, Nov. 1; hotel owner.

Roberts, Ellis Henry, 90, Utica, N. Y., Jan. 8; Representative from New York, 1871–5, Treasurer of the U. S., 1897–1905.

Robinson, Albert Alonzo, 74, Topeka, Kans., Nov. 7; railroad official.

Robinson, Douglas, 63, Amsterdam, N. Y., Sept. 12; capitalist.

Roebling, Charles Gustavus, 69, Trenton, N. J., Oct. 5; engineer and manufacturer.

Rollins, Montgomery, 50, Boston, April 18; banker, author.

Rosenthal, Max, 84, Philadelphia, Aug. 8; etcher and painter.

Rusling, James Fowler, 83, Trenton, N. J., April 2; Civil War general, lawyer, author.

Sage, Margaret Slocum (Mrs. Russell), 90, New York, Nov. 4; capitalist and philanthropist.

Savage, Minot Judson, 76, Boston, May 22; Unitarian clergyman.

Schultze, Augustus, 78, Bethlehem, Pa., Nov. 12; president emeritus of the Moravian College.

Scrymser, James Alexander, 78, New York, April 21; capitalist.

Searle, George Mary, 79, New York, July 7; Roman Catholic clergyman, astronomer.

Shauck, John Allen, 76, Columbus, O., Jan. 3; justice of the Supreme Court of Ohio.

Sheridan, Michael Vincent, 77, Washington, Feb. 22; brigadier-general, U. S. A., retired.

Shoemaker, Henry Francis, 73, Riverside, Conn., July 2; banker, railroad official.

Shoop, John Daniel, 61, Rockville, Ind., Aug. 9; superintendent of Chicago public schools.

Shuman, Abraham, 80, Boston, June 26; merchant.

Sibly, Frederick W., 65, Rockford, Ill., Feb. 18; brigadier-general, U. S. A.

Sickels, David Banks, 81, Paterson, N. J., July 19; author.

Sigerfoss, Edward, 50, died of wounds in France, Oct.; brigadier-general, U. S. A.

Sims, Winfield Scott, 73, Newark, N. J., Jan. 6; inventor.

Slemons, W. F., 89, Monticello, Ark, Dec. 12; former Representative from Arkansas, Confederate general.

Smith, Harry James, 37, New Westminster, B. C., March 17; author, playwright.

Smith, Henry Leavitt, 70, Williamstown, Mass., Sept.17; publisher.

Smith, Jacob Hurd, 78, San Diego, March 1; brigadier-general, U. S. A., retired.

Smith, John Addison Baxter, 72, New Orleans, March 9; rear-admiral, U. S. N., retired.

Smith, Joseph Fielding, 80, Salt Lake City. Nov. 19; president of the Mormon Church.

Smith, Kirby Flower, 56, Baltimore, Dec. 6; professor of Latin in Johns Hopkins University.

Smith, Mary E. ("Christine Faber"), 68, New York, May 23; author.

Southworth, George Champlin Shepard, 75, Springfield, Mass., Feb. 19; former professor of English in Kenyon College.

Speer, Emory, 70, Macon, Ga., Dec. 13; U. S. district judge, Southern District of Georgia.

Speyers, Arthur Bayard, 72, Montreal, Nov. 19; rear-admiral, U. S. N., retired.

Spooner, Henry Joshua, 78, Providence, Feb. 9; Representative from Rhode Island, 1881–91.

Sprague, Homer Baxter, 88, Newton, Mass., March 23; late president of the University of North Dakota, author.

Stephenson, Isaac, 88, Marinette, Wis., March 15; lumberman, Senator from Wisconsin, 1907-15.

Sterling, John A., 61, Washington, Oct. 17; Representative from Illinois, 1903-13 and since 1915.

Sterling, John William, 74, Grand Metis, Quebec, July 5; lawyer.

Stern, Heinrich, 50, New York, Jan. 30; physician.

Stevens, Edwin Augustus, 60, Washington, March 8; engineer.

Stillman, James, 67, New York, March 15; banker.

Stoll, William Taylor, 82, Franklin, Ind., Nov. 1; Baptist clergyman, president emeritus of Franklin College.

Stone, William Joel, 69, Washington, April 14; Senator from Missouri since 1903.

Straight, Willard Dickerman, 38, Paris, Dec. 1; major, U. S. A., financier.

Sullivan, John Lawrence, 59, West Abington, Mass., Feb. 2; pugilist.

Summers, Maddin, 41, Moscow, May 4; U. S. consul general at Moscow.

Swain, Joseph Skinner, 67, Brookline, Mass., Dec. 6; Baptist clergyman, editor.

Symonds, Joseph White, 78, Portland, Me., Sept. 28; lawyer, former judge of the Maine Supreme Court.

Talbot, Joshua Frederick C., 75, Washington, Oct. 5; Representative from Maryland, since 1903.

Taylor, John Metcalf, 73, Hartford, Conn., Nov. 6; president of the Connecticut Mutual Life Insurance Co.

Thompson, William Hanna, 84, New York, Jan. 18; physician.

Tillman, Benjamin Ryan, 70, Washington, July 3; Senator from South Carolina since 1895.

Trunbull, Charles Smith, 70, Philadelphia, Feb. 21; ophthalmologist.

Twichell, Joseph Hopkins, 80, Hartford, Conn., Dec. 20; Congregational clergyman, author.

Van Hise, Charles Richard, 61, Milwaukee, Nov. 19; geologist, president of the University of Wisconsin.

Van Wyck, Robert Anderson, 71, Paris, Nov. 15; Mayor of New York, 1898-1901.

Vibbert, William H., 78, Morristown, N. J., Aug. 27; Episcopal clergyman.

Wadsworth, William Austin, 70, Boston, May 3; agriculturalist.

Wagner, Charles, 67, Paris, May 13; preacher, author.

Ward, Aaron, 66, Roslyn, N. Y., July 5; rear-admiral, U. S. N., retired.

Watson, Irving Allison, 68, Concord, N. H., April 3, physician.

Weld, Christopher Minot, 59, Milton, Mass., Aug. 27; financier.

West, Paul, 47, Paris, Oct.; journalist and playwright.

Westengard, Jens Iverson, 47, Cambridge, Mass., Sept. 17; professor of international law in Harvard University, late general adviser to the Siamese Government.

Wetmore, Edmund, 80, New York, July 8; lawyer.

Wheaton, Lloyd, 80, Chicago, Sept. 17; major-general, U. S. A., retired.

Wheeler, Arthur Martin, 82, Westbrook, Conn., July 17; professor emeritus of history in Yale University.

Wheeler, James Rignall, 57, New York, Feb. 9; professor of Greek art in Columbia University.

Wherry, William Mackey, 82, Cincinnati, Nov. 3; brigadier general, U. S. A., retired.

White, Andrew Dickson, 86, Ithaca, N. Y., Nov. 4; U. S. Ambassador to Germany, 1897-99, president of Cornell University, 1867-85.

White, Jay, 49, Naples, May 24; U. S. consul at Naples.

Whiting, Robert Rudd, 41, Darien, Conn., Oct. 15; editor and author.

Williams, Evan, 50, Akron, O., May 24; singer.

Williams, Henry Shaler, 71, Havana, July 31; professor emeritus of geology in Cornell University.

Williston, Samuel Wendell, 66, Chicago, Aug. 30; professor of palæontology in the University of Chicago.

Wilmarth, Lemuel Everett, 82, New York, July 27; artist.

Wilson, Emmett, 35, Pensacola, Fla., May 29; Representative from Florida, 1913-15.

Wing, Francis Joseph, 67, Cleveland, Feb. 1; former U. S. district judge.

Wood, Edwin Orin, 56, Pasadena, Cal., April 23; editor, author.

Wood, Henry Clay, 86, Portland, Me., Aug. 30; brigadier-general, U. S. A., retired.

Wright, Henry Parks, 78, New Haven, Conn., March 17; late dean of Yale University.

Young, Ella Flagg, 73, Washington, Oct. 26; educator.

FOREIGN NECROLOGY

Abdul Hamid II, deposed Sultan of Turkey, 69, Constaninople, Feb. 10.

Agnew, William Lockett, 60, London, Feb. 15; publisher.

Aldunate, Santiago, 59, Washington, April 17; Ambassador from Chile to U. S.

Alexander, (Sir) George, 59, London, March 15; actor, manager.

Alexieff, Michael, Yekaterinodar, Oct. 10; Russian general, commander in chief, 1917.

Ardigo, Roberto, 89, Padua, Italy, Feb. 7; philosopher.

Ballin, Albert, 61, Hamburg, Nov. 9; general director of the Hamburg-American Steamship Co.

Barry, (Sir) John Wolfe, Wolfe-, 81, London, Jan. 23; civil engineer.

Bienerth, Count von, 54, Vienna, June 5; Premier of Austria, 1908-11.

Bille, Frank Ernest, 86, London, June 10; Danish diplomat.

Blake, (Sir) Henry Arthur, 78, Youghal, Ireland, Feb. 24; former Governor of Newfoundland, Jamaica, Bahamas, Hong Kong and Ceylon.

Boito, Arrigo, 76, Milan, June 10; poet and composer.

Boyd-Carpenter, (Sir) William, 77, London, Oct. 26; Canon of Westminster.

Brassey, Thomas, Earl, 82, London, Feb. 23; naval expert.

Brugere, Henri Joseph, 77, Col-du-Lautaret, Switzerland, Sept. 1; French general.

Butler, Henry Montagu, 84, Cambridge, England, Jan. 14; Master of Trinity College.

Cameron, Hugh, 83, Edinburgh, July 15; painter.

Campbell, Wilfred, 56, Ottawa, Can., Jan. 1; poet.

Chautemps, Emile, Paris, Dec. 10; French Minister of Marine, 1914.

Cipriani, Amilcare, 73, Paris, May 3; Italian revolutionist.

Courtney, Leonard Henry, Baron, 85, London, May 11; British statesman.

Cui, Cesar, 82, Petrograd, March 14; composer.

Debussy, Claude, 55, Paris, March 26; composer.

De Diego, Jose, 48, New York, July 16; Speaker of the Porto Rican House of Delegates.

De La Blache, Vidal, 73, Paris, April 6, geographer.

De Pena, Carlos Maria, 65, Washington, April 30; Minister from Uruguay since 1911.

D'Harcourt, Count Eugene, Locarno, Switzerland, March 9; composer.

Diederichs, von, Baden-Baden, March 10; German admiral.

Duff, (Sir) Beauchamp, 62, London, Jan. 20; British general.

Eichhorn, Field Marshal Hermann von, Kiev, July 30; German commander in the Ukraine.

Evans, (Sir) Samuel Thomas, 59, Brighton, England, Sept. 13; president of the British Prize Court.

Forrest, John, Baron, 71, at sea, Sept. 4; Australian statesman.

Frankenthurn, Baron Gautsch von, 67, Vienna April 22; former Premier of Austria.

Friedrich II, Duke of Anhalt, 61, Dessau, April 22.

Frey, (Sir) Edward, 90, Bristol, Oct. 18; British jurist.

Gibbons, (Sir) George Christie, 70, Montreal, Aug. 8; Canadian chairman of the International Waterways Commission.

Hamilton, Henry, Sandgate, England, Sept. 4; dramatist.

Hohenlohe-Schillingsfurst, Prince Conrad von, 54, Dec. 24; former Premier of Austria.

Hussein Ben Ali, King of the Hedjaz, August.

Jerrold, Laurence, 45, Paris, Nov. 5; English journalist and author.

Jones, Llewellyn, 77, St. Johns, Jan. 9; Angelican Bishop of Newfoundland and Bermuda.

Kaempf, Johannes, 76, Berlin, May 25; speaker of the German Reichstag.

Knowles, (Sir) Charles George Frederick, 85, Oxford, England, March 3; British admiral.

Leblanc, (Sir) Pierre Evariste, 64, Quebec, Oct. 18; Lieutenant-Governor of Quebec.

Lecocq, Alexandre Charles, 86, Paris, Oct. 25; composer.

Lehmann, Liza (Mrs. Herbert Bedford), London, Oct. 16; singer, composer.

Leopold, Duke of Anhalt, Dessau, Sept. 12.

Martinelli, Sebastian, 69; Rome, July 5; cardinal, Apostolic delegate to U. S., 1896-1902.

Metin, Albert, San Francisco, Aug. 16, chief of the French Diplomatic Mission to Australia.

Mills, Lawrence Heyworth, 80, Oxford, England, Jan. 29; professor of Zend philology in Oxford University.

Mohammed V, Sultan of Turkey, 73, Constantinople, July 3.

Moneta, Ernesto Teodoro, 85, Milan, Feb.; president of the International Society of Peace.

Montono, Viscount Ichiro, 56, Tokio, Sept. 17; Japanese Minister of Foregin Affairs, 1916-8.

Nicholas II, former Emperor of Russia, Ekaterinburg, July 17.

O'Brien, Richard Barry, 70, London, March 19; author.

Ohnet, Georges, 70, Paris, May; novelist and dramatist.

Oreste, Michel, 59, New York, Oct. 28; late President of Haiti.

Paes, Sidonio, 45, Lisbon, Dec. 14; President of Portugal.

Paget, (Sir) Alfred Wyndham, 66, London, June 17; British admiral.

Parry, (Sir) Charles Hubert Hastings, 70, London, Oct. 8; composer.

Pellissier, George Jacques Maur, 66, Paris, June 19; literary historian.

Peters, Carl, Sept. 10; German explorer.

Playfair, Arthur Wyndham, 48, Brighton, England, Aug. 28; actor.

Prinzip, Gavrio, Prague, April 30; assassin of Archduke Franz Ferdinand.

Redmond, John Edward, 66, London, March 6; leader of the Irish Nationalists.

Reed, (Sir) George Houston, 73, London, Sept. 12; late High Commissioner for Australia.

Renault, Louis, 74, Barbizon, France, Feb. 8; professor of international law in the University of Paris.

Resnati, Antonio Silvio, Mineola, N. Y., May 17; Italian aviator.

Rhondda, David Alfred Thomas, Viscount, 62, London, July 3; Food Controller of Great Britain.

Richards, John Morgan, 77, Ventnor, Isle of Wight, Aug. 11; author, publisher.

Richthofen, Baron von, killed in action in France, April 21; German aviator.

Rostand, Edmond, 50, Paris, Dec. 2; French poet and dramatist.

Rothschild, Alfred Charles de, 75, London, Jan. 31; banker.

Roux, Jules Charles, 77, Paris, March 8; president of the Campagnie Générale Transatlantique.

Safonoff, Wassili, 65, Kislovodsk, Russia, March 13; conductor.

Schreiber, (Sir) Collingwood, 86, Ottawa, March 23; consulting engineer to the Canadian Government.

Serafini, Domenico, 65, Rome, March 6; cardinal, Prefect of the Congregation of the Propaganda.

Sise, Charles Fleetwood, Montreal, April 9; president of the Bell Telephone Co. of Canada.

Sliosberg, Henry, Petrograd, August; Russian jurist.

Smith, (Sir) Swire, 76, London, March 16; educator.

Spring Rice, (Sir) Cecil Arthur, 58, Ottawa, Can., Feb. 14; British Ambassador to U. S., 1912–18.

Thierry, Joseph, 61, Madrid, Sept. 23; French Ambassador to Spain.

Tisza, Count Stephen, 57, Budapest, Nov. 1; Premier of Hungary, 1913–17.

Valdez, Ramon, Panama, June 3; President of Panama.

Valvarde, Joaquin, 45, Mexico City, Nov. 6; composer.

Wedekind, Franz, Munich, March 9, German playwright.

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